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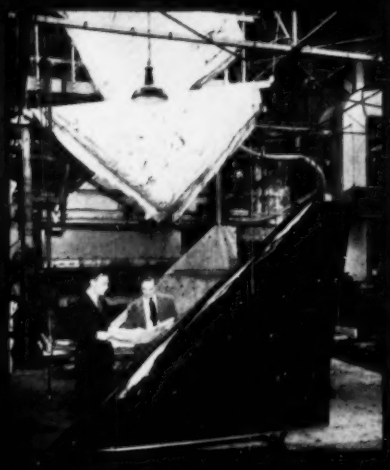
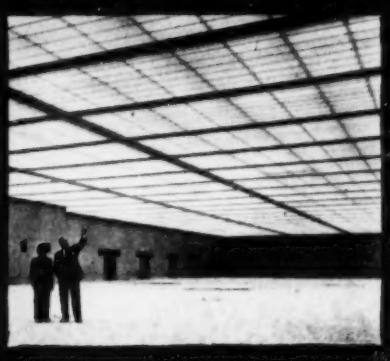
AUGUST 1954

DIGEST

INTERNATIONAL BUSINESS AND INDUSTRY





RECESSION no longer troubles the U.S. businessman. Other questions occupy his thoughts. They could mean better business for him – and you . . . p13

PLASTICS, wonder materials in their own right, enjoy a world-wide boom that's here to stay p15

POWER DISTRIBUTION for the world's industrial muscles is in an era of change. New trends emerge p22

BETTER PLANTS through modern materials and methods is the objective when enlightened management begins its planning for tomorrow p30

OFFICE MACHINES can cut your costs. And you can make a standard machine do your special jobs p33

GLOBAL COMMUNICATIONS is International Telephone and Telegraph Corp.'s business. Here's how and where it serves you in your business p43

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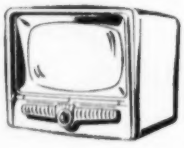

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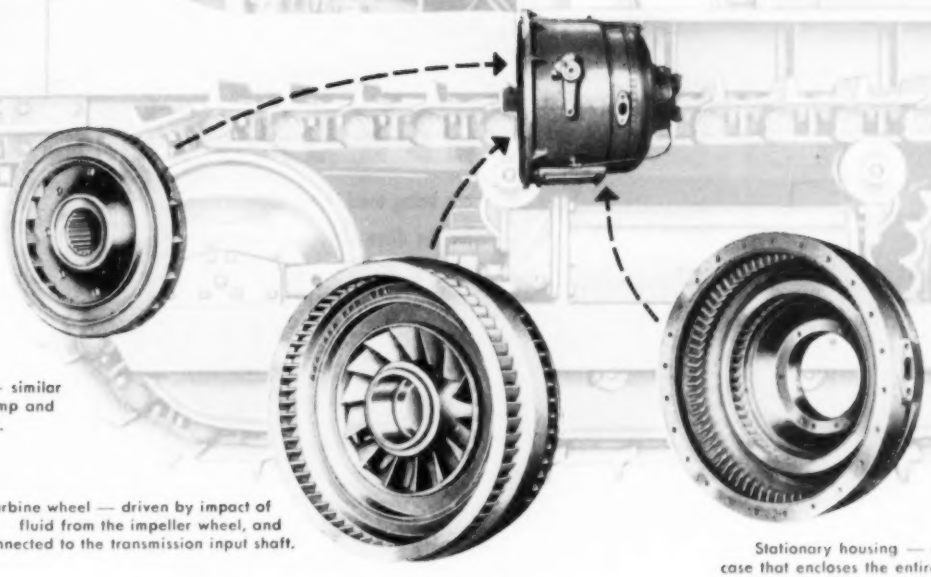

Impeller wheel — similar to a centrifugal pump and driven by engine.

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Stationary housing — a fluid-tight case that encloses the entire unit and incorporates the reaction blades.

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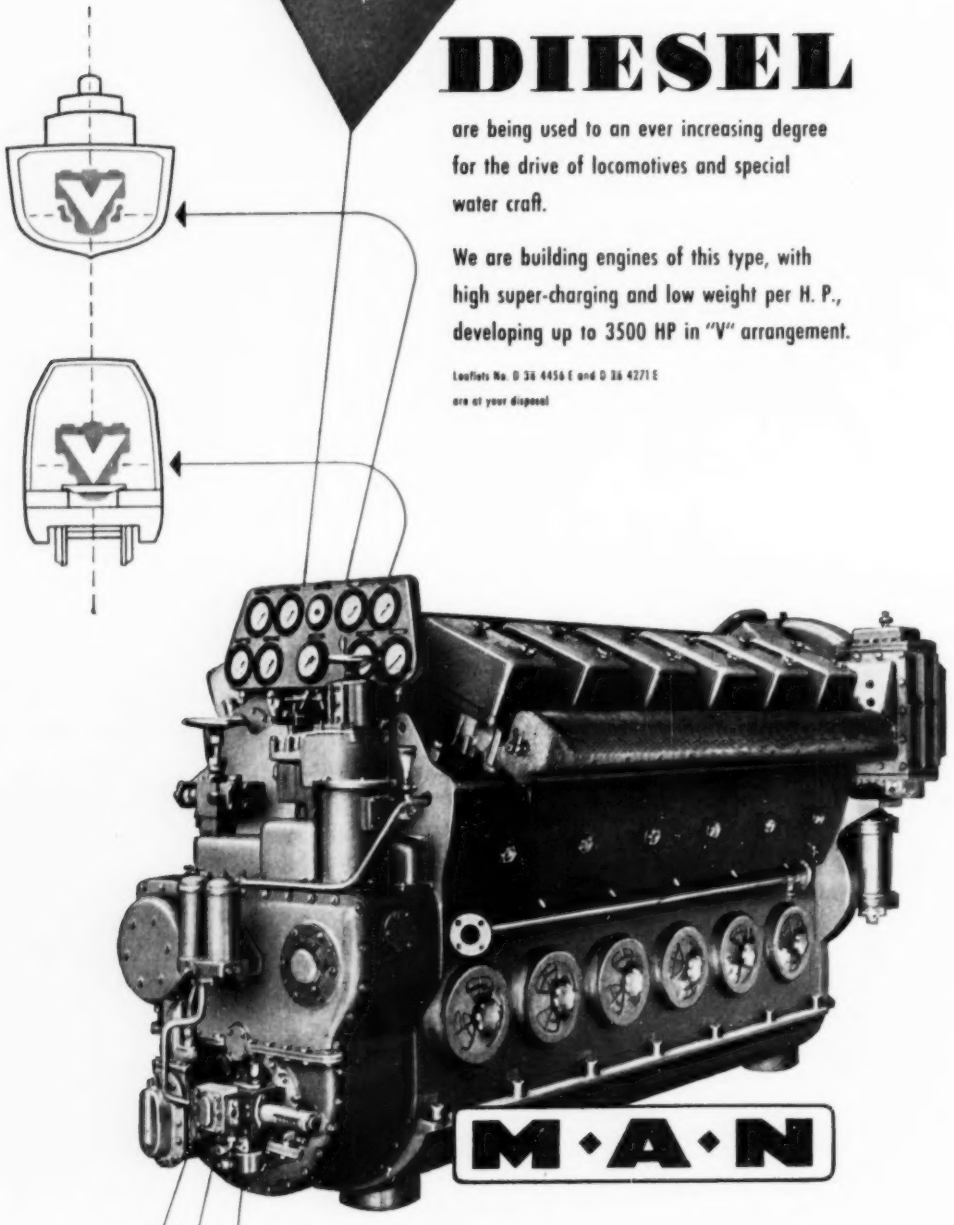

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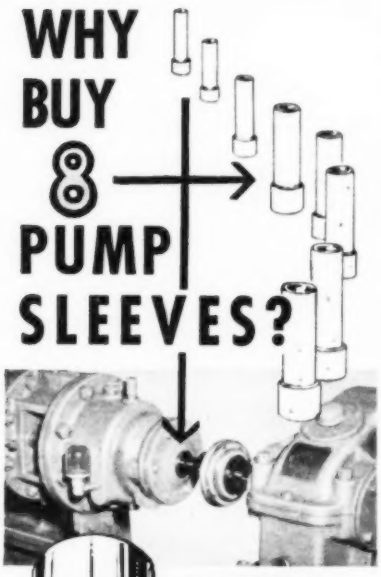

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. . . the best from 48 business magazines—see p56

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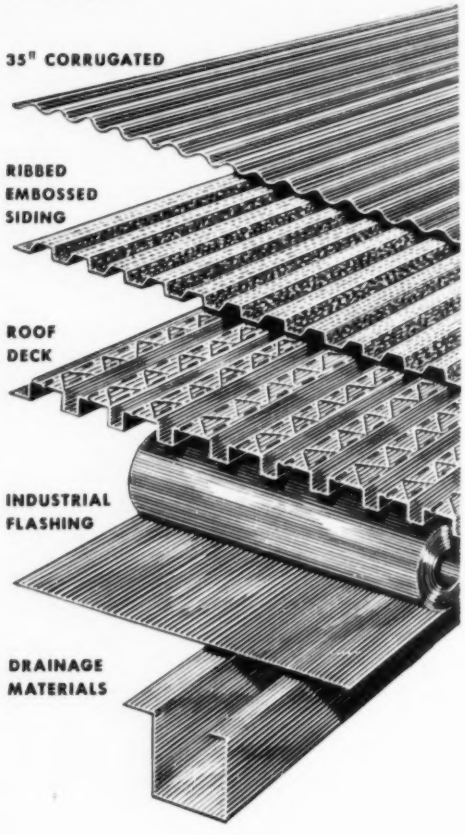

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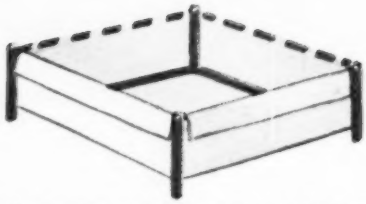
TO *jog a designer's imagination*



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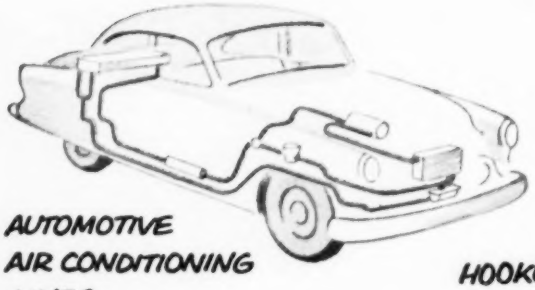

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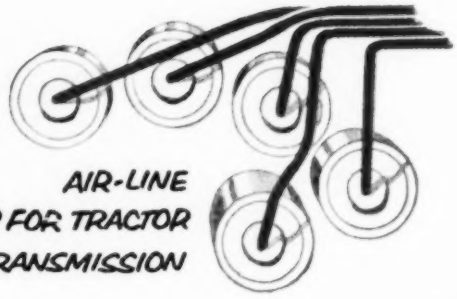

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High endurance limit	Takes plating
Extra-strong	Bright and clean
Shock-resistant	No inside bead
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BUSINESS TRENDS

U.S. BUSINESS is headed for an autumn upturn. Virtually all signs point to this. One top trend: booming construction (housing, highways, etc.), with 1954 business now predicted at $36-billion, up 2% over 1953 and an all-time record.

Production, inventories, retail sales, and employment have all taken on a healthier look. The Federal Reserve Board's industrial production index turned upward (to 125% of the 1947–49 average) for the first time in a year.

Only major weak spots are the soft-coal industry (see below) and textiles, the latter reflecting a 7% apparel sales cut. Factory employment also still lags. But factory orders are increasing, encouraging hopes of a job upturn.

Expansion of credit through the Federal Reserve Board's recent relaxation of member banks' reserve requirements will encourage the business revival. But the Board retains effective controls should an inflationary trend set in.

LONG-RANGE BUSINESS TRENDS in the Western hemisphere, as projected into the mid-1970's by U.S. government and business officials, show spectacular advances.

• **United States**—Gross national product will rise by 1977 to $750-billion (in terms of 1952 dollars), more than double the present figure . . . Electric-power generating capacity will triple or quadruple—from 92-million kilowatts now to 300 or 400-million (of this, 40 to 65-million may be nuclear) . . . Industrial capital equipment will more than triple today's total.

• **Canada**—Gross national product will soar by 1977 to $83-billion, 3½ times the present figure.

• **Latin America**—Combined national products will soar by 1977 from $40-billion today to $274-billion, a seven-fold gain. Per capita output will rise from $238 to $750.

U.S. SOFT COAL INDUSTRY, now in a major depression that has idled a fourth of its mines and workers, is busily researching for new coal uses. The aim: to recover markets lost to oil and natural gas, and to open up new ones.

Research is already far advanced on a gas-turbine locomotive fired by pulverized coal under pressure. Other research is centered on sharply raising the efficiency of conventionally fired engines. Among by-products, fly-ash is now finding an important use as a cement substitute.

Fully automatic small coal furnaces for heating buildings or homes may also help the industry. One such furnace now under test is controlled by a thermostat, just like gas and oil furnaces. Its secret is an electric igniter that fires pulverized coal when the temperature requires it.

TITANIUM, "wonder metal" of the future, is the subject of a growing research race among big U.S. and Canadian companies. Reason: Once a low-cost, continuous, commercial production process is perfected, demand is expected to soar from almost nothing to between 500,000 and 2-million tons yearly.

The metal's brilliant future stems from its excellent strength-weight factor (it weighs half as much as steel and has twice aluminum's strength) plus anti-corrosion performance rivalling that of stainless steel.

But so far, in the U.S., only two firms—Du Pont and Titanium Metals—are processing ilmenite ore into titanium sponge commercially. Both use the expensive "Kroll process" to produce a total of 5,000 to 6,000 tons yearly for sale at $4.72 per lb. The race now is to find a new process that will topple this price.

Paradoxically, U.S. aircraft designers are shying away from large use of the metal because of uncertain supplies. That's why U.S. government has cut civilian purchases pending creation of a 4,000-ton reserve for aircraft firms.

MOVING PEDESTRIAN WALKS are expected to develop into a major industrial trend following the opening of the world's first "moving sidewalk" in New Jersey (see page 19).

Next belt-conveyor walk to go into operation will replace the congested ½-mile-long underground "shuttle" train system between New York's two main subway stations. It will have two-way platforms giving access to passenger cars.

But main potential users are:

• **Cities**—They will install underground "moving walks" to carry pedestrians to busy downtown business and shopping areas, permitting parking in fringe areas and cutting downtown traffic congestion. Elsewhere, individual shopping centers will install surface belts between parking areas and stores.

• **Airports**—Belts will move to and from plane landing areas, saving long walks and cutting needs to taxi planes close to buildings.

• **Stadia**—Belts will carry patrons to and from top-level seats.

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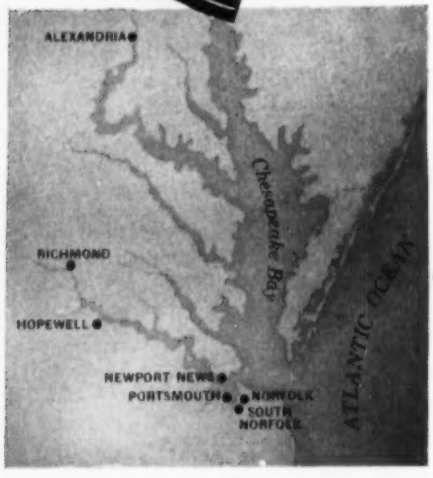

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INTERNATIONAL TRENDS

WASHINGTON—Saddled with the biggest farm surpluses in its history, particularly wheat, corn and butter, the U. S. government hopes to sell at least $300-million of these products abroad in the fiscal year 1954–55. Under the plan, sales will be made for foreign currencies at competitive prices. Efforts will also be made to give away products for famine relief and for propaganda value behind the Iron Curtain.

The government will lean over backwards to avoid dumping. Both administration and Congressional leaders are aware of the danger of touching off a world farm-price war. This would hurt normal U. S. farm exports as well as those of other agricultural exporting countries.

The U. S. will insist that countries receiving surpluses for local currencies take measures to boost their over-all consumption of farm products. Theoretically, this would forestall cuts in their normal agricultural imports.

Such efforts to avoid dumping will slow down the program at the start. Recipient countries will have to take such measures as loosening up consumer and investment credit, and expanding defense and public investment programs.

A big slice of the foreign currencies the U. S. earns from sales of surpluses abroad will be spent to help recipient countries carry out such measures. It's realized that otherwise they would have neither the funds nor the incentives to expand consumption of farm goods.

The U. S. program will be aimed primarily at under-developed, food-deficient countries like India. Rapid expansion of food consumption is easier in such countries.

If it works as expected, the surplus disposal operation could snowball, in effect, into a large-scale permanent foreign-aid program under the pressure of mounting U. S. surpluses.

NEW YORK—Nine years after the war, world economic recovery has reached, in 1954, an historic landmark—Western Europe and other free-world areas are back on their economic feet again. The chief pointers: (1) soaring gold-dollar stocks; (2) a rise in U. S. commercial exports.

- **Free-world gold-dollar holdings** (excluding U. S.) are at a record $23.5-billion, up $2.2-billion in a year and $15.4-billion since 1949. Even allowing for U. S. aid, now dwindling, these figures spotlight the astonishing turn-about in free-world economy. For the first time, large-scale convertibility becomes possible.

- **U. S. commercial exports** hit $4.1-billion in the first third of 1954, up slightly over 1953; the upward trend is continuing. This reflects revitalization of the free-world's ability to buy in the U. S., as reflected also in liberalization of dollar imports in Germany, Holland, and elsewhere.

- **Expanding U. S. exports** will tend to bolster imports. These declined 6% (to $3.6-billion in first third of 1954), but are still massive. Moreover, part of the decline was due to recession-prompted cuts in raw-materials inventories.

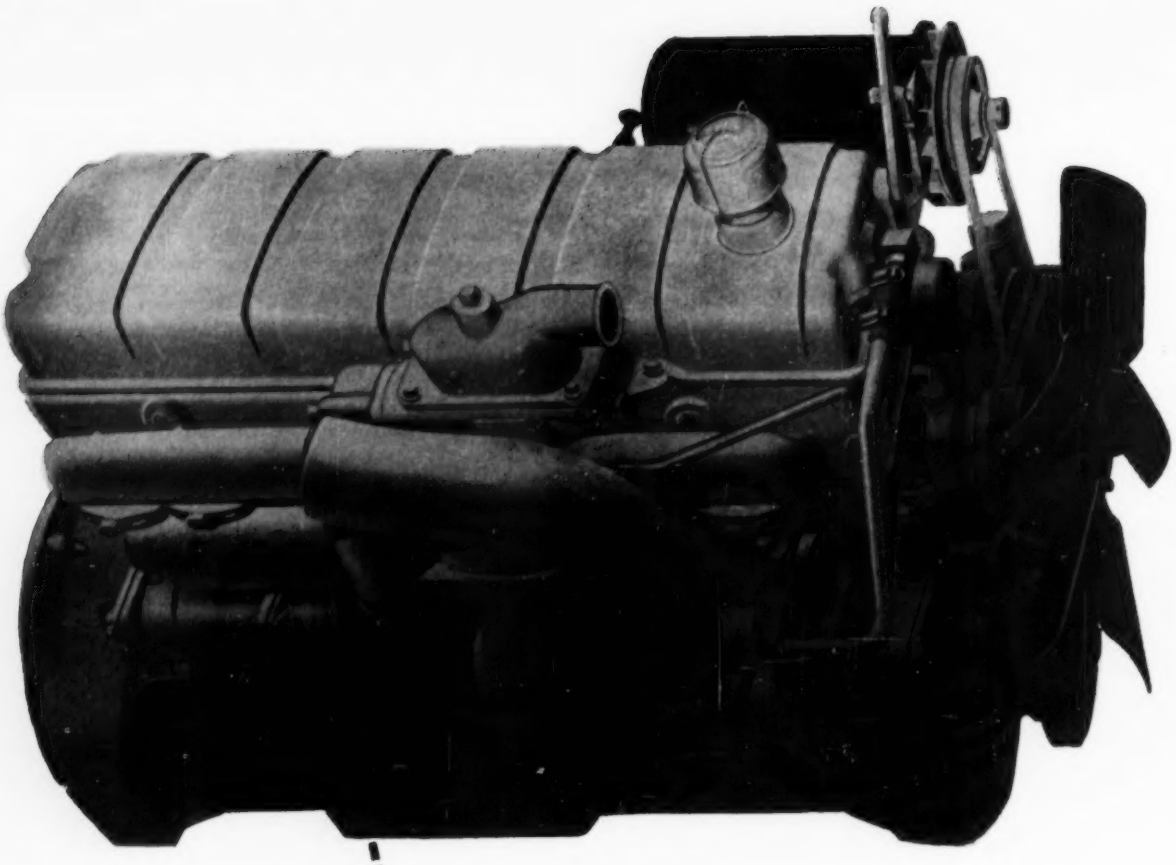
GENEVA—The rising tide of Red oil exports, both from Russia and its satellites, is a current trade phenomenon. From only 1-million tons in 1952, exports contracted for this year total 4.9-million tons, with three-fourths destined for Europe, the rest to Argentina, Egypt, etc.

This flow of liquid "Red gold"—about 2% of world oil trade—is still far below 1932's record Soviet exports of 6-million tons and is only a fraction of since-expanded Soviet production. This is said to have passed 52-million tons in 1953—more than 2½ times 1932 output. The goal for 1955 is 70-million tons (U. S. crude output in 1953, 383-million tons).

Observers here suggest the Red oil export drive has two goals: (1) to finance the purchase of consumer goods for Russia's restless population; (2) to drum up political goodwill in Western Europe by offering to buy goods with oil or gold.

But Soviet exports have not over-impressed European businessmen. A Kremlin change of mind, they realize, might dam the oil flow overnight. Hence, only short-term deals are practical.

WORLDWIDE—London: British automobile exports (still exceeding half the total output) have soared 25% above 1953 outflow; biggest market—Australia . . . Washington: U. S. investments abroad ($39.4-billion) have doubled since 1946; foreign investments in U. S. ($23.6-billion) rose 50% . . . Milan: The fourth European Machine Tool Show here, Sept 14–23, will attract 772 exhibitors; biggest exhibitor will be Germany (285 firms), followed by Italy, France, Switzerland, Britain, Belgium, U. S. . . . New York: Foreign bicycle imports, averaging 28,000 monthly (mostly from Britain), have jumped from 3% to 70% of U. S. output since 1949; local makers are clamoring for import quotas.



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- Gets more work done than other engines of comparable horsepower.
- Costs less to maintain . . . lasts longer . . . gives more profitable operation.

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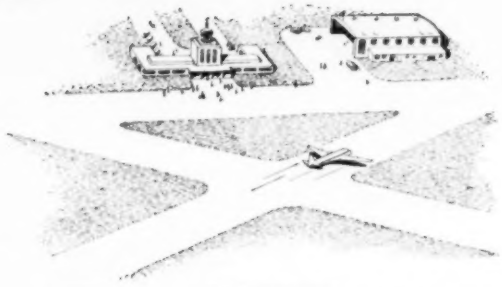

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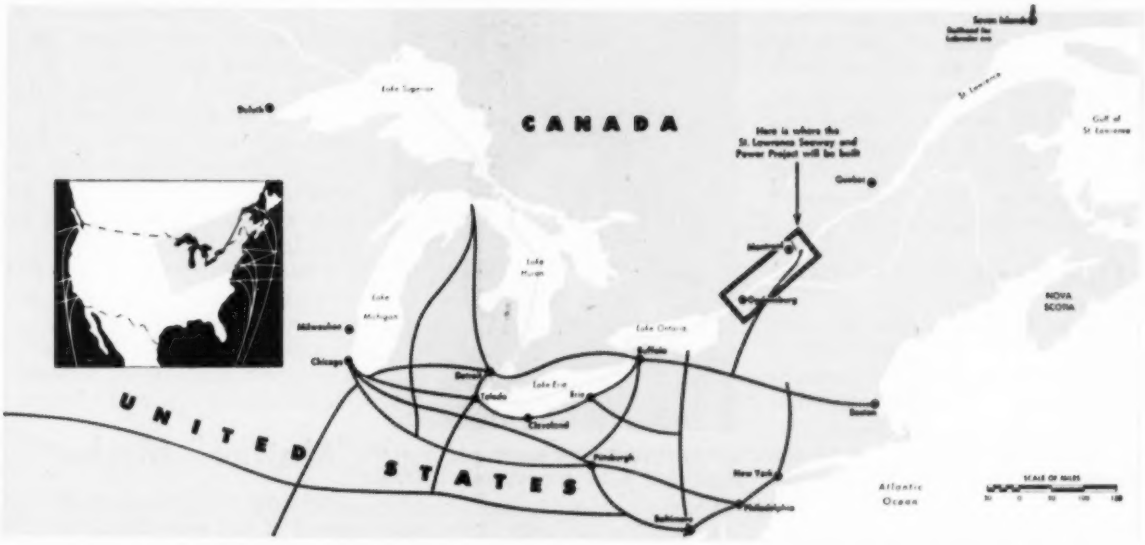
McGRAW-HILL DIGEST



As summer heads toward autumn, the St. Lawrence seaway and power project are among . . .

Key U. S. Business Topics

The seaway will profoundly affect U. S.-Canadian and world business. Other matters for thought: elections, diversification, the "mature" market

BASEBALL, golf, and "getting away from it all," even for a short time, are among major preoccupations of the American businessman just now.

But whatever his relaxation, he is also giving serious thought to some important factors that are likely to affect his—and the world's—business. Among the new topics:

St. Lawrence

The twin St. Lawrence projects—a great power plant athwart the U. S.-Canadian border and a 27-ft.-deep navigable channel from Lake Ontario to Montreal, opening up the entire St. Lawrence and Great Lakes systems to world shipping—will have profound business effects on both countries and the world.

Power—Shared by the U. S. and Canada, the power plant's 12.6-billion kw.-hr. annual output will bring critically needed power to Canada's fast-growing industries on Lake Ontario's north shore. In the U. S., by cheapening power costs, it will attract much new business to New York State and New England.

Transportation—Here the key factor is cheaper carrying costs to and from the heart of America by the new deep-water route to be opened 6 to 8 years hence. For one thing, this may change plant location patterns.

Many U. S. manufacturers who use imported raw materials and have found it economical to locate plants on the coast, even though distributing their products nationally, may now find it advantageous to set up Midwestern branch plants. Also, companies that do a major export business will have less incentive to locate on the coast.

Midwestern companies that have never thought much about exports will gradually take more interest in foreign business and how to develop it.

As regards specialized U. S. interests, the railways and Eastern coastal ports are the most apprehensive. They fear they may be heavy losers to the seaway's estimated 44.5-million tons of annual traffic. And since the seaway will be ice-bound about 5 months a year, they assert they will have to keep their facilities on a standby basis for those months. Proponents of the seaway reply that it will greatly expand economic activity, benefiting the entire country, including all ports and railways.

The most basic question of all

perhaps, is what effect the seaway will have, over-all, on imports and exports. Cheaper shipping costs will, of course, help U.S. exporters. But they will also help foreign exporters to sell in the U.S. market. On balance, will U.S. manufacturers gain or lose?

The best answer perhaps was given by a U.S. Commerce Dept. official: "Over the long pull, if you increase trade—both ways—everybody will be better off."

Elections

Three months before the election, the outcome is very much in doubt. The present party balance in Congress is narrow: House—219 Republicans, 215 Democrats, one independent; Senate—48 Republicans, 47 Democrats, one independent.

Whichever way the poll goes, party margins will probably stay narrow. But businessmen realize that even bare control by one or the other party could mean important national policy swings. For instance, and parodoxically, President Eisenhower's trade liberalization policy is much less liked in his own party than in the Democratic party. Hence it would benefit by a Democratic victory.

Here is the outlook:

House—The 435 contests will hinge largely on local factors and personalities. Neither party is likely to win more than a 20-seat majority. The Democrats are slightly favored.

Senate—The 35 contests will be more affected by national issues. Republicans are favored; their 13 seats up for contest are mostly safe ones. But of 22 Democratic seats, six are "uncertain."

Among the chief issues:

• **Eisenhower** — His personal popularity is still high. Strategic appearances by the President—and re-emergence of Citizens for Eisenhower Clubs—in critical districts, may help some Republicans.

• **Foreign Policy**—The key factor is Southeast Asia. Committing of U.S. troops might have a decisive effect on the election. War or threat of war would hurt Republicans in the Midwest.

• **Farm Price Supports**—The President's insistence on flexible as distinct from rigid support has split Republicans. Democrats say the Eisenhower policy could cost 40 Republican farm-belt seats. Republicans contend the issue has been over-magnified.

EISENHOWER'S popularity, still high, will help Republicans at the polls.

• **Prosperity**—A late summer or autumn business decline might cause a Democratic tide. But present signs point to active business (see page 7).

Diversification

Since the end of World War II, the question of diversifying outside a single product line, a particular market, or a limited geographical area has become something more than a matter of choice on management's part. It is almost possible to justify this exageration: Diversify or die.

Basically the chief reasons for diversification are the old ones: (1) protection against a decline in one line; (2) a leveling of seasonal production humps; (3) a hedge against cyclical changes.

But there are other, larger factors at work too:

• **Competition**—The old days of geographical isolation are gone. Information gets around fast. If a man makes a success of a new product today, he finds he has dozens of competitors overnight. Constant technological advances add to competition; what yesterday was a fast-selling product may be just a has-been tomorrow.

• **War Diversification**—During World War II many a manufacturing company found, much to its surprise, that it could switch easily from a commercial product to shells or fuses. This nurtured the idea of diversification. Post-war profits, creating capital funds with no place to go, turned the idea into reality.

• **Trade Liberalization**—Reciprocal trade and lower tariff barriers seem likely in the long run. So companies affected by foreign goods—watch firms, for example—are branching into other fields.

"Mature" Market

Smooth passage through Congress of the new Social Security bill, which adds 10-million people to social insurance rolls while boosting benefits to 6-million already covered, has stimulated businessmen's interest in the market among older people.

The broadening of benefits swells purchasing power in this group. Even more significant, statistics show that longevity, and hence the natural breadth of the market, is constantly growing.

Since 1940, the gain in 65-and-over population has been better than 40%, against a gain of slightly more than 20% for the total population. In the spring of 1953, there were 13.3-million people of 65 and over in the U.S.

Studies show these traits among "mature" people:

• The 65-and-over group spend their money. They have more disposable income as their responsibilities (growing children, mortgages, etc.) decline.

• Many of them set up housekeeping establishments. Many are in the market for homes.

Some manufacturers already are thinking in terms of specialized products for older people. For instance: "Non-skid" paints that will keep older people from slipping on wet floors; bathtubs that are easy to get in and out of. —Business Wk, June 12, p134; June 19, p31, 54, 127

Plastic Profiles: Families, Uses, and Characteristics

Plastic Families	First Produced in U.S.	Typical Uses	Special Qualities	Limitations
Cellulosics	1868	Display packaging, irrigation pipe, eyeglass frames, rayon and acetate textiles	Toughness, high impact strength, luster, easy fabrication, good dielectric	Relatively low heat resistance
Phenolics	1907	Telephone handset, radio-TV cabinets, shell molding, dials, grinding wheels	Hard, strong, good temperature range and elec. insulation, low water absorption	Dark colors only
Alkyds	1926	Linoleum surfacings, refrigerator and automobile paints, ignition parts	Fast curing, good dimensional stability, good dielectric, heat resistance	Low impact resistance
Aminos	1929	Buttons, dishes, laminated tabletops, kitchen appliance housings	Unlimited color range, good dielectric, resistance to organic solvents	Require great care in molding
Acrylics	1931	Aircraft turrets, automobile tail-lights, brush backs, signs, textiles	Optical clarity, good weather resistance, shatter resistance, machinability	Relatively soft surface, subject to scratching
Vinyl Resins	1936	Safety-glass interliner, floor coverings, garden hose, phonograph records	Tough, strong, wide color range, good dielectric, resistance to chemicals	Plasticizers tend to migrate over period of time
Nylon	1938	Gears, slide fasteners, combs, tumblers, tennis racket strings, textiles	Strength and toughness over wide temperature range, long-wearing, self-lubricating	Require very tight mold, expensive
Styrene Resins	1938	Kitchen housewares, refrigerator parts, toys, wall tiles, lighting fixtures	Lightness, excellent moldability, unlimited color range, tasteless, odorless	Low impact resistance, poor weather resistance
Polyethylene	1941	Squeezable bottles, semi-rigid kitchenware, packaging, coaxial cables	Inert to solvents, flexible and tough over wide temp. range, non-toxic, odorless	Streaky colors, waxy or greasy feel, lusterless
Polyester Resins	1942	Reinforced plastics for automobile bodies, boats, translucent panels, textiles	Weather resistance, can be formed with low pressure, strong, colorful, easily filled	Will sometimes crack in curing, high mold shrinkage
Silicones	1943	Electrical insulation, circuit breakers, waterproof coatings, automobile polishes	Extreme heat resistance, low water absorption, good dielectric properties	Hard to mold, requires long curing cycle, expensive
Fluorocarbons	1943	Pump diaphragms, chemical tubing, high-temperature insulation	Extreme corrosion and solvent resistance, wide temp. range, high impact strength	Poor adhesion with other materials, expensive
Epoxies	1948	Printed circuit backing, adhesives, surface coatings, transformer laminates	Excellent adhesion, resistance to chemicals and heat, curable at room temperatures	Expensive

Plastics: International Boom

U.S. leads industry, but Britain, Germany, and other lands share growth. New trends include automation, irradiation.—An original Digest article

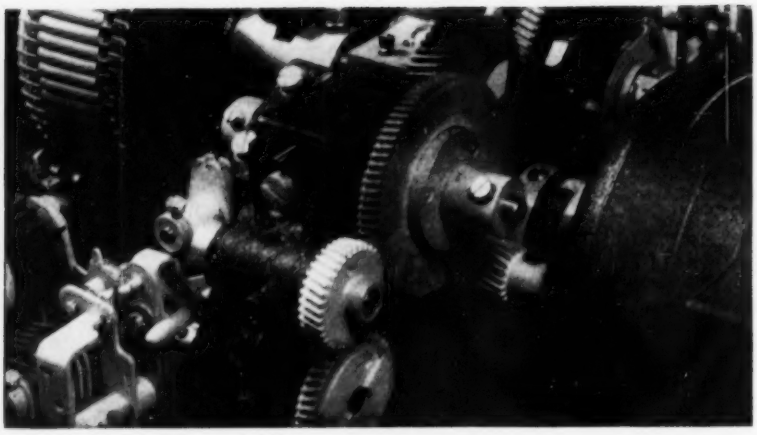
ON A BRIGHT blustery summer morning, Mr. Average Citizen in an advanced industrial country might do these things: jiggle a toothbrush, push a razor, pull a shower curtain, put on his spectacles, grab a coffee cup, switch on a radio, answer the phone, snatch up a raincoat, and ride a bus to work.

Back home, that same morning, his wife would be busy stacking dishes, shining cabinet tops, shaking out the trash basket, pushing a vacuum cleaner, squeegeeing a little deodorant, and wheeling out the kiddy stroller. As for Junior, age 1, he might very well be bawling for his pink and blue rattle.

The chances are that every one of these things that this typical family might typically do—just starting a new day—would involve things made wholly or partly of plastics. For an hour or two, our three Citizens would be milling around in a multi-colored synthetic wonderland. They would also be symbols of one of the great growth industries of our age.

In a couple of generations, plastics have come from nowhere to everywhere. Since 1922, production of synthetic resins—the base materials of plastics—in the United States alone has multiplied 500 times. It has passed all metals but steel. Similar expansion stories have unfolded in Britain, Germany, Japan and other lands.

When the U. S. Society of the Plastics Industry recently staged its Sixth National Plastics Exposition at Cleveland, some 140 overseas plastics experts from 28



MAIN DRIVE-GEAR TRAIN in a British teleprinter uses phenolic-laminated spiral gears (foreground) in combination with steel gears.

countries turned up to view the thousands of products. An interpreter speaking eight languages was kept busy explaining exhibits ranging from buttons and screws to machinery gears, automobile bodies and sailboats.

Where did this tremendous industry spring from? Where is it heading? Basically, of course, it is the outgrowth of Man's ingenuity with chemicals—his ability to conjure brand new materials, completely unknown to his ancestors, out of petrochemical or coal-tar products such as acetylene, styrene, and ethylene.

The process started last century. It was in 1868 that John W. Hyatt, an American inventor, produced cellulose nitrate—the first commercial plastic—as a substitute for ivory in billiard balls. At about the same time, British chemists were developing plastic-type lacquers. Another great step 41 years later saw Dr. Leo H. Baekeland produce the phenol-formaldehyde resin "Bakelite".

But it was World War II, with its multitudinous material shortages, that gave the industry its biggest boost. The result is that today there are upwards of a dozen major plastic families (chart, p15). Their progeny have multiplied into the thousands through the use of such ingredients as "plasticizers" (used to make a plastic more workable); fillers (to give it bulk); or modifying chemicals (to make it harder or more heat-resistant, or tougher, or more elastic).

Today the industry has truly come of age. It has emerged from an *ersatz* category—with many of its "substitutes" once distrusted by public and businessmen alike—to a fully recognized major industry in its own right. Because of their strength, lightness, corrosion resistance, dielectric strength, and other qualities, its products have won equal respectability as industrial materials with wood and metals. And the industry has already revolutionized such industries as floor coverings, pipe, paint, kitchenware, electronics.

The two types of plastics are:

• **Thermoplastics**—These undergo a physical (not a chemical) change in processing. A thermoplastic product will melt if heated up again to the critical temperature. Examples: fluorocarbons, styrenes, acrylics, nylon, vinyls, polyethylene, the cellulosics.

• **Thermosetting plastics**—These undergo a chemical reaction under heat and pressure. Once formed into a product, they cannot be remelted. Examples: the aminos (urea and melamine), polyesters, phenolics.

As for forming and fabricating techniques, these run all the way from various types of molding to extrusion, casting, calendering, coating, high-pressure laminating, and reinforcing. Examples:

• **Injection molding**—An automatic machine melts the plastic and squirts it into a mold at high pressure. When the plastic resolidifies, the machine ejects it.

• **Vacuum forming**—A sheet of thermoplastic is clamped over a mold and heated. Then air is drawn out from between the mold and the plastic. The plastic settles against the contours of the mold much as a wet shirt settles against a man's arms and shoulders.

This, then, is the fabulous world-wide plastics industry. Now let us scan its growth and outlook in some individual countries.

UNITED STATES—Last year American production of synthetic resins reached nearly 3-billion lb. This year it will be higher. That means a gain of 30% over 1952. The industry has a knack of doubling in size every 5 years. Its yearly output is worth $1.5-billion.

About 50 big companies produce the bulk of the raw plastics. They range from great chemical concerns like Union Carbide, Dow, E. I. du Pont de Nemours, and Monsanto to rubber, electrical and oil concerns. There are about 5,000 molders, fabricators, and finishers.

Practically three-quarters of U. S. output consists of older plastics like styrenes, vinyls, alkyds, and phenolics. But some of the newer ones are booming:

Polyethylene—This waxy plastic makes millions of squeeze bottles. Big future fields: packaging, industrial pipe, electrical insulation. Now running at about 130-million lb. yearly, it is expected by some to be the first plastic to reach 1-billion lb. yearly. Latest development: General Electric's Irrathene—an irradiated polyethylene film of exceptional high heat and cracking resistance.

Polyesters—Reinforced with such materials as fibrous glass, these tough, durable plastics can "take it." Most promising uses: automobile bodies, fishing rods, boats, bathtubs.

Silicones—These able heat resistors got their start as high-temperature aircraft lubricants. Expanding and future uses include gaskets, electrical insulation, water- and stain-repellent materials, anti-foaming agents. Latest development: silicone rubbers with twice or thrice the tear strength of competing materials.

Fluorocarbons — These are among the most expensive and remarkable plastics. A Du Pont paint, made with Teflon, costs $75

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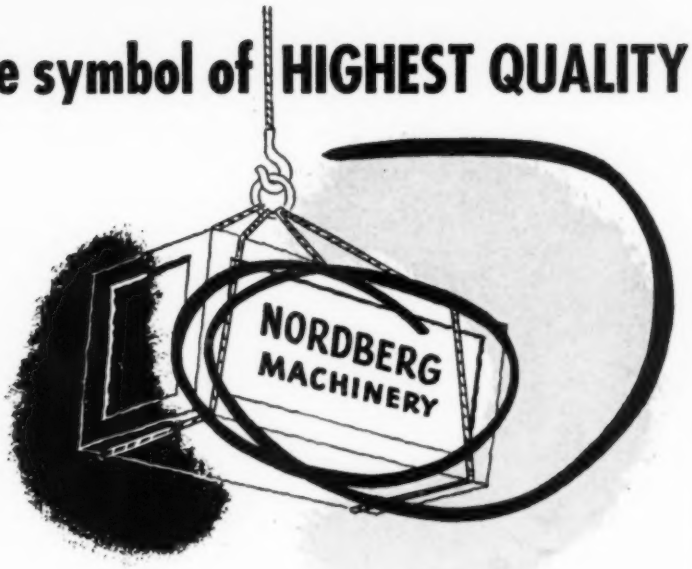

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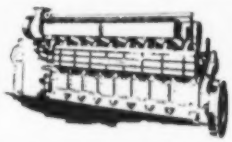

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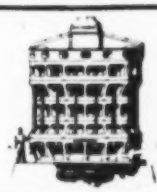

SYMONS CONE CRUSHERS

MINE HOISTS

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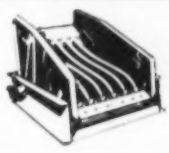

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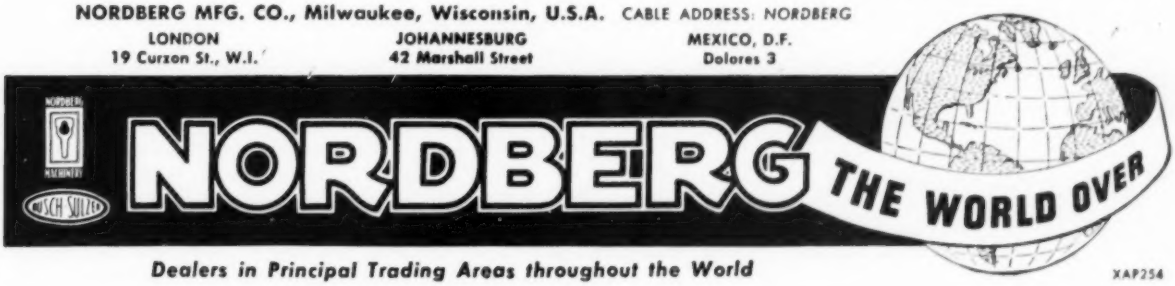


Dealers in Principal Trading Areas throughout the World

XAP254

"Dreams range from plastic mortar to poured floorings . . ."

per gal. but gives so super-smooth a finish that Teflon-painted baking tins needn't even be greased.

All these gains have only spurred plastics men. For example, General Electric's drive to beat the heat-resistance factor — one of plastics' major weaknesses—by atomic bombardment may open up entirely new fields.

Molders, too, are working hard to beat their problems. One of these is to cut down molding time. Here the latest twist is automation. Fully automatic machines are operating in both the injection and compression molding fields.

As for the future, dreams range from plastic mortar to poured floorings and plastic houses. All agree there is only one direction for the industry: upward. One guess as to growth in the next 20 years: an eight-fold expansion.

BRITAIN—Output of resins—414-million lb. in 1953—is almost twice the 1949 total and constantly rising. There are forty major producers, hundreds of processors.

The biggest producer, Imperial Chemical Industries, has announced a new plant to make 22-million lb. of rubber-like butadiene resins yearly, beginning in 1956. Last year Monsanto Chemicals Ltd. greatly expanded its facilities for making Lustrex polystyrene (in Melbourne, it also opened Australia's first polystyrene plant).

British expansion has been mostly in thermoplastics. But research now centers largely on reinforced thermosetting resins. The consumption trend is heavily toward industry, which takes two-thirds of all British resins.

Outstanding events include: aviation — development by the Royal Air Force of plastic wings (phenolic resin bonded with asbestos felt); coal—adoption of a goal of 100% plastic conveyor belting in all British mines.

GERMANY (Federal Republic)—Largest European producer, West Germany last year turned out 480-million lb. of raw plastics, or more than three times 1949 output. Production today is growing so fast that it is expected to reach 640-million lb. in 1955.

The resins of about 70 manufacturers, including such big firms as Farbenfabriken Bayer, Badische Anilin- und Sodafabrik, Dynamit, and Farbwerke Hoechst, flow to 1,200 processors.

Research is directed largely toward polyethylene, silicones, and fluorocarbons. Problems to be solved include: silicones — high cost; fluorocarbons — processing difficulties; polyethylene—lack of raw materials (oil, natural gas).

Capital shortage has hampered the launching of any major research campaign. But the recent formation of an Institute for Scientific Research on Synthetic Resins may galvanize research.

FRANCE — Practically moribund during the occupation, plastics rebounded to a 94-million-lb. resin output last year, more than double 1946 output. Redoubling of the total is expected by 1959.

Leading resin producers are the Pechiney, Rhone-Poulenc and St. Gobain firms. There are about 2,700 processors. Pechiney will soon open the first European factory to make Saran vinyl film. Next year it will also heavily exploit Rilsan, the new French product made from a castor-oil base.

Research is directed chiefly toward improving quality and diversification of plastic compounds. It is hampered somewhat by lack of raw materials, particularly gases. The most spectacular use growths have been in electrical, building and paint industries.

Outstanding future uses: polyester automobile bodies, refrigerators, and artificial lungs; acrylic orthopedic equipment; polystyrene linotype, replacing lead-antimony alloys.

ITALY—Resin-makers will turn out 90-million lb. of plastics this year, three times 1948 output; a 120-million lb. total is forecast for 1958. Italy's coal lack hampers production of some plastics, but the recent development of methane-gas deposits and opening of 20 refineries (to handle imported oil) will help the industry expand its output.

The Montecatini Co., with a broad product range, leads half a dozen major producers. Research centers on polyesters, polyethylene, and ion-exchange resins. New patented processes include continuous production of semi-transparent corrugated glass-reinforced polyesters and stamping of one-piece doors.

JAPAN—Starting from scratch on V-J Day, Japan's output of plastic materials has reached 236-million lb. yearly, with 280-million forecast for 1958. There are about 16 producers, 2,000 processors.

A major problem is lack of raw materials, especially oil and gas. This has retarded output of fluorocarbons, polyesters, polystyrene, and polyethylene. But production of the ureas, vinyls, and alkyds—for which Japan has raw material supplies—has soared. The future depends largely on Japan's ability to import materials.

BRAZIL—Plastics are strictly a postwar business, still small, but growing. Two U. S. affiliated producers, Koppers and Bakol (Union Carbide), turn out most of the annual 18-million lb. polystyrene output. Two new plants, financed from Belgium (Solvay) and U. S. (Goodrich), will begin this year to produce 10-million lb. of polyvinyl chloride.

Although wide open for expansion, the industry is handicapped by foreign-exchange and import difficulties. All large fabricating machines must be imported. So must the bulk of raw materials.

MEXICO—Six plants backed by U. S. firms (Monsanto, Bakelite, Continental Can, Du Pont, Celanese, and Goodrich) have started producing resins since the war. Britain's ICI is also there.

Current yearly output includes —polystyrene, 13-million lb; vinyls, 7-million; polyethylene, 1.5-million. Monsanto Mexicana will soon start producing high-impact styrene for refrigerators, textile bobbins, etc. Its biggest present market is wire insulation. The company imports liquid and gas raw materials from Texas City, Texas, in tank cars.

The market is rapidly expanding behind high tariffs. Biggest trend: use of waterproofing spread-type plastics, spread over fabrics by mechanical "knives."

Dacron-Wool Blends Dyed in a One-Step Process

One step union dyeing of Dacron-wool blends has been announced by Victor Chemical Works, New York, N. Y., in collaboration with Textile Aniline & Chemical Co. The process is based on the use of diammonium phosphate as a regenerating agent.

Several acetate dyestuffs, used with a carrier, can dye Dacron. The carrier, either ortho-phenyl-phenol or para-phenyl-phenol, acts as a swelling agent on Dacron and is applied in a water phase after having been made soluble by being converted to a sodium salt.

In order to function as a wetting agent, the sodium salt must be regenerated to the carrier. DAP (diammonium phosphate) precipitates the sodium salt at a pH of around 8.9 to 9.0. After the bath has been boiled, the pH is decreased to 7.6 for dyeing the wool component of the blend.

Advantages from dyeing Dacron-wool blends in a dye bath with a pH above 7.0 are:

1. Time saving. One bath only is required.
2. Elimination of carrier spotting.
3. Elimination of scouring.
4. Increase of fastness to perspiration.
5. Increase of resistance to sublimation.—Textile World, May, p134

Long-Life Conveyor

New flight conveyor, developed by Fisher & Ludlow, Birmingham, England, is a tubular unit. It can carry materials in powder, sludge or granular form.

Flights are round Neoprene-skirted units connected by links, which also are protected by Neoprene washers. Chain flexibility enables it to follow any direction in which the pipe may be bent.

When a conveyor tube wears, it can be rotated 120° to provide a new wearing surface. This feature lengthens conveyor life and, at the same time, permits use of a much lighter tube than would otherwise be needed.—Mach, May 1, p751

World's First "Speedwalk" Helps City Workers

This is the world's first "Speedwalk." Installed on the New Jersey side of the Hudson River, it carries homebound workers up a slope to the Erie Railroad station, eliminating a 227-ft. ramp (mostly with a 10% grade), which they previously had to climb. The $75,000 installation consists of a 460-ft. endless rubber-and-fabric belt, 5½ ft. wide and ⅝ in. thick, riding on a bed of closely spaced steel rollers. Power unit is a 20 hp. General Electric motor, which drives the belt at 120 ft. per min. Passenger capacity is 10,800 per hr. The new device heralds wide use of similar "speedwalks" by cities and stores (see page 7).—Business Wk, May 29, p33

Steel Hot Extruded for Short-Run Output

Hot extrusion is a metal-forming method well suited to small-lot production. Therefore, it is getting considerable attention. Allegheny Ludlum Steel Corp. has announced that it now is extruding a variety of stainless-steel shapes. The process can be set up at relatively small die cost so change-over from one shape to another loses little production time. Small tonnages can be produced quickly.

Hot extrusion is also under study at Lockheed Aircraft Corp. and Harvey Machine Co. on alloy steels and titanium.

Die design, lubricant, extrusion temperature, extrudability, and heat treatment were investigated. Results included:

- **Best extrudability** was obtained at 2150°F. on stainless steel.
- **Filling** was best in heavy sections.
- **Quality** of extruded parts was good. Fatigue, compressive and tensile strengths equalled or exceeded those of wrought materials.
- **Glass wool** was found to be generally the best lubricant. Others tried were molybdenum disulfide and graphite, lime feldspar, white mica, and a molten salt mixture.—Iron Age, Apr 29, p57 and 98

Torch Cleans Castings

A 6,000°F. jet torch cleans castings at American Chain & Cable Co. It's easier to handle and faster to use than a pneumatic chipping gun. And it removes less parent metal, yet does not cover defects.

The torch consists of a ½-in.-dia. carbon electrode in a holder, beneath which is a small air jet. The arc melts cracks, fused-in sand, fins, brackets, nails. The air jet blows away molten metal and slag, leaves a casting of uniform contour. The jetted area is then rebuilt with sound weld metal.—Factory, May, p138

The remedy may help you!

How a drug firm cured its *payroll* headache

The weekly payroll grew bigger, more complex and more time-consuming, when Uribe Angel S.A. Laboratories, big pharmaceutical firm in Medellin, Colombia, expanded and modernized.

Too much valuable executive time was taken up with this routine operation, that could more profitably be used for selling, planning and policy decisions.

The Burroughs man was called in for advice. After careful study, he designed a simple method for handling the payroll and recommended a Burroughs Typewriting-Computing Machine to do the work.

Result? The weekly payroll is now handled in only six hours by one girl, and is more exact. Each entry is printed on separate cards, showing each employee's tax deductions, social benefits and other necessary items. The machine is also used for statistical and production costs jobs.

Can your business profit from faster facts? Your *local* Burroughs man offers expert advice on modern machine methods, expert service. Burroughs Corporation, Detroit 32, Michigan, U.S.A.

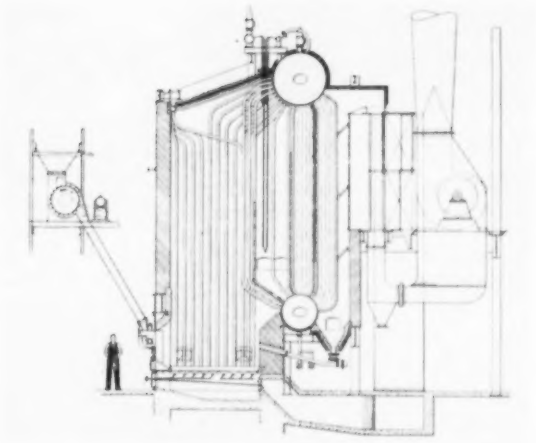
"It's paying for itself," says Mr. Alexis Drufovka, Mgr. of Uribe Angel S.A. Laboratories, about their Burroughs Typewriting-Computing Machine. *Another case where Burroughs meant better business.*

Call your Burroughs man

This Month's How To . . .

. . . burn bagasse efficiently

One way to get top steam-generating efficiency in bagasse-fired raw-sugar furnaces is to use a mechanical spreader-stoker boiler unit. It has a variable-speed drum-type feeder, permitting distribution of bagasse (sugar-cane residue) over the grate surface in a level, thin layer. Other modern bagasse-fired furnaces include: (1) boiler with pneumatic spreader stoker, chain-type bagasse feeder, and traveling grate; in this type, an air jet explodes flowing bagasse as it enters furnace. (2) Ward hearth-type furnace, in which fuel is introduced by chute, permitting smaller particles to burn in suspension and larger pieces to start drying out before reaching the pile.—Power, June, p162

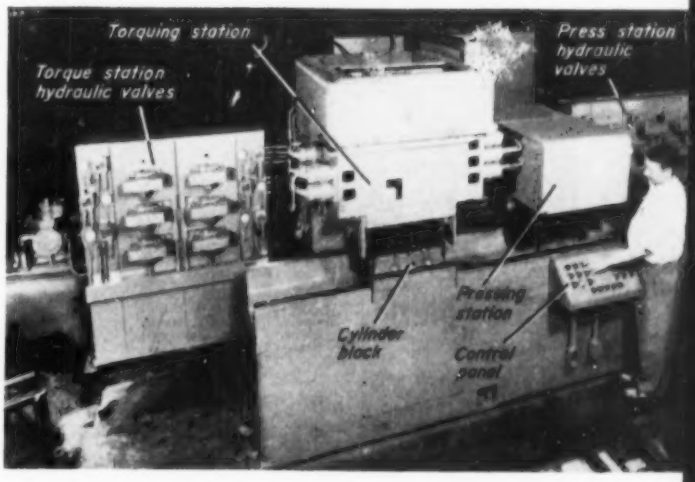


. . . forge another automation link

Hautau Engineering Co., Ferndale, Michigan, did it by a complete use of hydraulics in its new automatic nut torquing machine. Designed to tighten main-bearing capscrews of a V-8 engine block, the machine maintains a high-level quality-control standard.

The unit presses in ten dowel pins, moves block to torquing station, raises block to engage rotating spindles, tightens capscrews. The complete cycle takes 24 sec.

Unusual design feature is running capscrews down with low pressure, high volume of oil and then switching to high pressure, low volume to apply more accurately the final torque. At the selected torque setting, the motor stalls out and reverses.—Prod Eng, June, p150

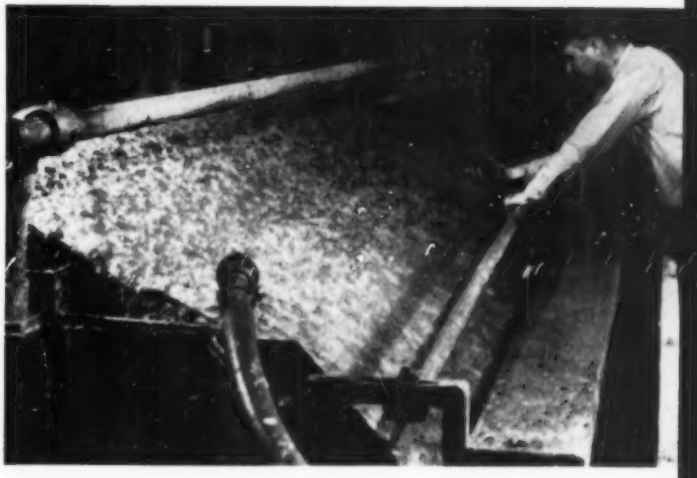


. . . answer the knock of opportunity

One way in the chemical field is to develop an economical method of preparing reasonably pure quantities of cellulase and hemicellulase—the cellulose-hydrolyzing enzymes. The market is waiting.

In the pulp and paper industry, enzymes hydrolyze certain cellulosic components of paper stock and improve its quality. A few companies have been developing such enzymes and techniques. But still needed for commercialization is a reliable enzyme source.

Other uses: to increase cellulose fibers' absorbency in textile manufacturing; increase absorbency of cotton gauze for surgical dressings; predigest cattle feed; peel potatoes.—Chem Eng, June 19, p66



X-Ray's Odd-Shaped Parts

Rubber bag filled with plastic granules eliminates the need for a different jig to hold each part for X-ray inspection. Normally the bag is limp. When air is partly exhausted from it, it becomes putty-like, can be molded to fit any part. When fully exhausted, the bag "freezes" into the molded shape. The pliable jig has tripled inspection output of irregularly shaped parts for Solar Aircraft Co.—Factory, May, p104

Modernizing Handling in Multistory Plant

Materials handling was a first-class problem at Brown & Sharpe Mfg. Co.'s machine-tool plant. The trouble: 43 acres of floor space in several buildings ranging from one to six stories high.

The solution was multifold. First, a central transfer station was set up for palletizing of unit loads before delivery to outlying shops. Trucks, carrying loads both ways, shuttle between central transfer and designated areas in various buildings.

Elevator loading was eased by traffic plans. Elevators now carry uniform work loads at all hours. Loading all elevators uniformly has cut down long waits for elevators.

The whole system has been built around 18 fork trucks. Heavy castings, for example, were stacked in the foundry yard by crane and moved by platform trucks. Now, castings are palletized in the foundry and moved through storage and processing by truck.

Oils were handled in 50-gal. drums by hand and platform truck. Now, a rotating-head clamp fork truck handles and even empties the drums.—Am Mach, June 7, p129

Power Distribution Trends

U. S. engineers plan higher primary voltages, greater reliability, and wider use of capacitors and aerial cable. Aluminum gains as conductor metal

WHAT ARE THE MAJOR TRENDS in electrical-power distribution philosophy today? To find the answers to this question in the American industry, the editors of *Electrical World* queried engineering executives of 62 utilities serving 23-million customers.

The dominant trend, they found, is toward higher primary voltages for rural and residential areas. As today's rural areas become suburban and commercial establishments move into residential communities, these new circuits will become general-purpose feeders.

Many utilities already accept this fact. They have adopted policies of holding older substations to their present load capability, relieving overloads by planned conversion to a new distribution voltage.

Here are the main findings and predictions of the nation-wide survey:

1. Primary voltage will rise to 12.47 kv., with alternates of 8.33 and 13.2 kv. But current programs for load relief reflect this long-range trend only occasionally. Among participating utilities, choice of 12.47 and 13.2 kv. for the future is 42% and 17% respectively, both nearly double the present percentages. No increase is shown for systems above 13.2 kv., but several utilities indicate consideration of 23 kv. for the long-range picture.

2. Residential service will continue at 120/240 v. Of utilities below that level, the majority will build toward it in the near future.

3. Three-phase service will expand gradually, using 3-phase transformers. Readiness to accept 3-phase transformers for power load in both residential and rural areas is clearly indicated.

4. Greater reliability will be built into design standards. Efforts to achieve this by building better distribution circuits are reported by 63% of the utilities. In most cases, increased conductor spacing is the chief improvement. Heavier construction is also an important factor.

5: Aluminum and ACSR (aluminum cable steel-reinforced) will dominate distribution conductors. From 38% at present, the trend is toward 51% use of these metals in primary conductors in the future. Significant in this gain is the use of all-aluminum. Its use, although a small proportion of the total, is expected to quadruple. Similar trends apply to secondary conductors. But copper remains the conductor choice of nearly one-fourth the utilities.

6. Aerial cable is often favored to relieve tree and pole congestion difficulties. Preference is generally for shielded, non-metallic sheath types. Only 18% of utilities contemplate using aluminum conductors in their aerial cable.

7. Capacitors will enjoy increasing use, with emphasis on switching. Trend to use of primary capacitors is indicated for 60% of circuits, against 51% today.

8. Trend to bus-regulated banks of 5,000 to 10,000 kva. each, or larger, in distribution substations served by 69 kv. or higher subtransmission seems to favor field assembly. The upward trend in primary voltage tends to accentuate this preference.

9. The larger number of circuits per substation may mean more cable exits in order to avoid overhead circuit congestion. Trend in cable use is toward a future total of 47%, against 43% today.

10. Secondary conductors will be larger. More utilities will use banked secondaries. Trend in use of the latter is upward from today's 35% to a probable 45% in 5 or 10 years. Boost in secondary wire size is contemplated by 24% of the companies.—Elec World, May 17, p133

Special-Design Racks Slash Handling Time

Towmotor Corp. has gasoline engines for its materials-handling equipment made by an outside supplier and then shipped to its assembly plant by truck. Towmotor had this trouble: the engines were palletized, but pallets were unsuitable for handling at Towmotor's plant. Also the engines had to be re-palletized for assembly operations.

Now engines are mounted on special racks at the supplier. Racks are designed to carry the engines from the supplier right through assembly operations at Towmotor. Also racks can now be stacked 5-high. This feature tripled Towmotor's storage capacity.

One basic rack handles six different engines. Several modifications to a standard rack made by Equipment Mfg. Co., Inc., and some adjustable accessories to meet Towmotor's requirements made this standardization possible.—Factory, May, p96

Bagging Can Cost Plenty

Have you studied your bagging costs lately? A good job means customers' goodwill. Watch these points for a good, economical job:

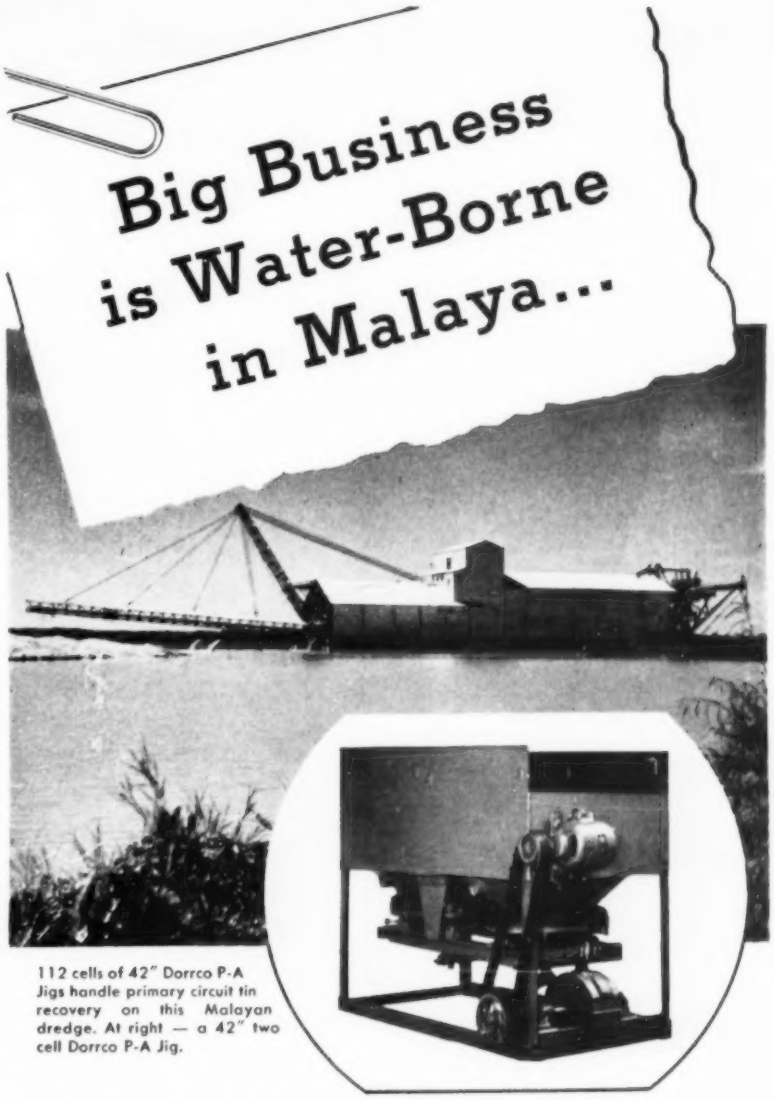
1. Use the right bag size. Increasing bag size may speed up bagging by making them easier to handle, but the added cost may make it too expensive.

2. Speed up the bagging operation for low-cost commodities as it's usually justified. A little lower accuracy is not so important as with high-cost products.

3. Improve weighing accuracy. If you are working to the high limit on not-so-accurate scales, you're giving away too much material.

4. Use the right type of bag. The open-mouth bag is usually the right one for slow operations. The valve bag, although it costs more, is less costly to handle. Get the right answer by an impartial study of comparative costs.

5. Sew bags automatically—after you are sure you are getting the best accuracy and lowest bag cost.—Chem Eng, June, p234



112 cells of 42" Dorrco P-A Jigs handle primary circuit tin recovery on this Malayan dredge. At right — a 42" two cell Dorrco P-A Jig.

Placer tin mining is big business in Malaya — source of better than a third of total world production. And dredging for the tin-bearing matrix is a big tonnage operation. For instance, the 304' dredge pictured above can dig 480,000 cubic yards per month from 130 feet below water level.

The bucket line discharges matrix to a trommel screen where oversize waste is separated from minus ⅜" feed for further processing. First step, and point of maximum tin concentration — fourteen batteries of Dorrco P-A Jigs, each comprising eight 42" x 42" cells. These units are compact and light in weight — important considerations in water-borne operations.

Tin recovery in Malaya may be of academic interest only to you. But, if you have problems involving any phase of the separation of finely divided solids in suspension — or ion-exchange — or fluidizing techniques... chances are that our worldwide organization can help you.

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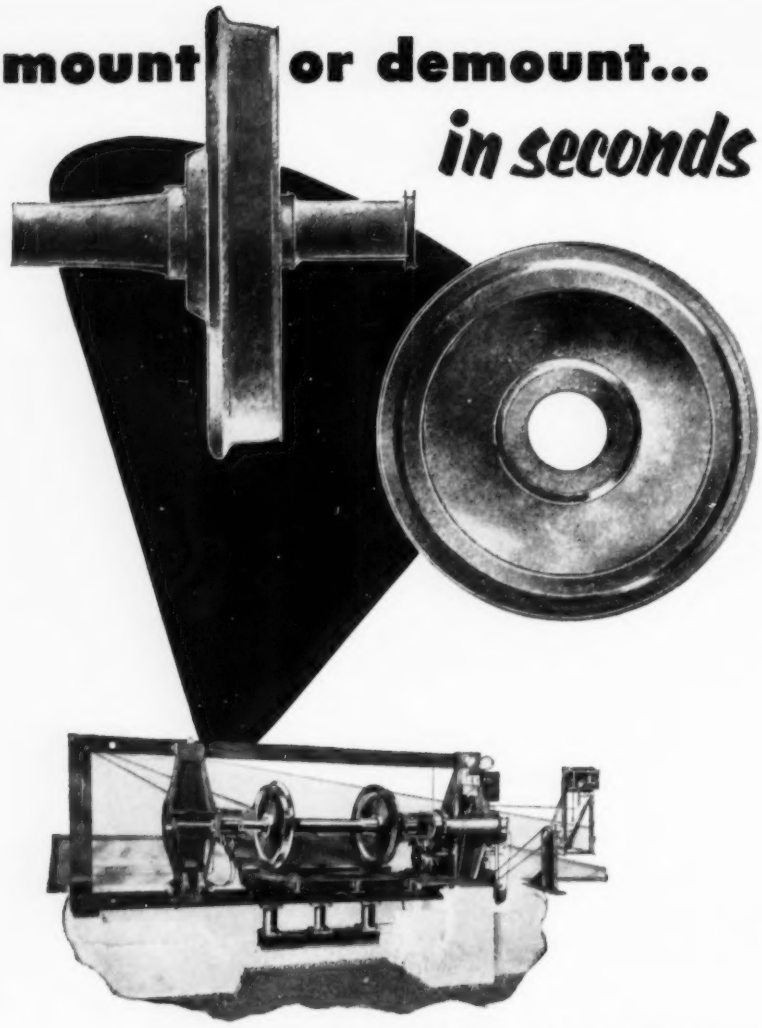

Save valuable man-hours with Watson-Stillman Hydraulic Wheel Mounting and Demounting Presses. Floor to floor time to demount a pair of wheels is cut to less than one minute—mounting time is reduced to a fraction of the rate required with old style equipment.

Here are the cost-saving features you gain when you specify Watson-Stillman equipment for your wheel shop.

- *Presses are furnished with complete tooling to handle full range of wheels.*
- *Straight-through arrangement provides for rapid and efficient work flow.*
- *Fast traversing speeds to and from the work mean quicker cycles, more output per man hour.*
- *Accurate sensitive controls for either one-man or two-man operation on both mounting and demounting presses.*
- *Push-button elevator operation to accommodate various wheel sizes quickly and easily.*
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Triple Play . . .

. . . of Himalayan goats, French designer, Scotch mills brings dollars. — An original Digest article

FROM HIMALAYAN GOATS comes cashmere. And cashmere is a favorite sweater material for many a U. S. sweater girl. Knowing this, Scotland's Lyle & Scott Ltd. has hired Christian Dior, French designer, to style its sweaters. L & S's aim: more dollars per sweater. (It cannot sell more sweaters because the supply of cashmere goats is limited). It's rumored that the added glamour of the Christian Dior label will bring in up to $50 a sweater—much more than now.

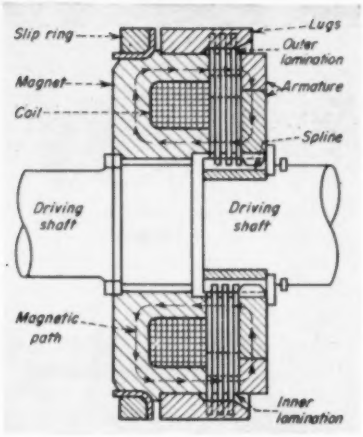
To L & S, which exports practically all of its output to the U. S., the boost can mean bigger profits. If the new sweaters make a hit with U. S. women as expected, other Scotch knitwear makers will probably tie up with big fashion names.

The little town of Hawick (you pronounce it Hoic), Scotland, is sure to benefit from this scheme. Most of Scotland's sweater makers center there, and the town is already in the midst of a boom. Last year it showed $10.2-million of export trade. This year, Hawick's sweater makers hope to do even better.

There is one dark cloud on Hawick's horizon. Without the goats, there would be no cashmere sweaters. But the goats call the Chinese Himalayas home. And any time they want to, the Chinese Communists can cut the supply.

While they worry about Communists' intentions, the British concentrate on solving transportation and cost problems. The cashmere has to be carried across the Gobi Desert to Tienstin, shipped down the coast to Shanghai and imported into the United Kingdom by a Yorkshire firm that has a near monopoly. Costs are sky-high. About $14 will get you one pound of cashmere. And it takes six goats to make that one pound.

One way out, the British see, is to raise the goats elsewhere. But so far the stubborn goats refuse to cooperate.



MAGNETIC CLUTCH, using new materials and new design, is smaller, more efficient

Electromagnetic Clutch Eliminates Linings

Using today's improved materials and making changes in time-honored designs often result in a smaller unit that does the same job in less space. A new multiple-disk electromagnetic clutch is an example. Its disks are steel; friction linings are eliminated.

A magnetic field causes the disks to adhere to each other, providing the necessary friction to transmit torque. The clutch will perform perfectly in an oil-vapor atmosphere or partly submerged in oil, and is recommended for use inside transmission housings. It will engage or disengage a driven shaft while the driving shaft is either running or standing still.

The magnet, with its embedded coil, is permanently fastened to the driving shaft. Lugs on the outer perimeter fit slots on alternate disks (outer laminations, see sketch). A spline on the driven shaft engages both the intervening disks and the armature.—Power, June, p133

Oil-Black Plant Opened

Dedication in May released information on one of the most modern, efficient plants in the carbon-black industry. It was Continental Blacks, Inc.'s new Oklahoma $2,750,000 oil-black plant with a capacity of 40-million lb.

Outstanding features include the high degree of instrumentation, high recovery of oil-feed carbon content, and nearly 100% collection efficiency of the bag filter.

Oil, gas, and air are fed to furnace reactors. Carbon black is formed in the reactors, quenched in water, and collected in a multistage cyclone system. The black is then pelletized.

Recovery in the new plant is 60%. The old channel process recovered only 5%, and gas furnace plants recover about 30%.—Oil & Gas J, May 31, p43

Chemical Notes Abroad

▶ **India**—A uranium-thorium plant will be completed by the end of the year. Initial major product will be 200 tons of thorium nitrate per year.—May 22, p38

▶ **Yugoslavia**—Lignite production is booming, thanks to United Nations' technical assistance. It may soon be a major export item. Just added is the output of a new 350-m. shaft at Valenge lignite mine.—Chem Wk, June 5, p38

Letter from the Editor

Dear Reader:

The foreign staff of the Digest recently completed a worldwide survey of what you, the reader, wants to see in the Digest. It is by these studies that we determine your principal interests and needs. I send my personal thanks to each of you that helped us make this study by contributing your time and thought.

In studying the results of the survey, I find many common interests. Unfortunately, I find too a common misconception as to the purpose and editorial approach of the Digest. So, in thanking you, I would like also to restate what the Digest is, what it is trying to do.

First, the Digest is a business and technical magazine directed to *management executives.* The material in the Digest is selected and written to be of direct use to those actively engaged in the many phases of company operation.

The magazine is primarily a digest, consisting of about two-thirds of abstracted material of technical nature. This material is selected to have the widest possible appeal. The other third of the magazine consists of business-type departments (Business Trends and International Trends) and original articles of broad interest.

Here the common misconception enters. Some of our readers believe the Digest's purpose is to offer complete, intensive coverage of all industrial fields. But that is not our purpose. Intensive coverage in any field can be given only by the special magazines that are written for that field.

But what we do is this: bring to you, from many fields, ideas and information that can be modified and applied to the operation of your particular business. Remember that Digest articles should be read and analyzed with this question in mind: Will it fit my business?

Added to this material is the general information that every progressive businessman needs in making sound decisions. The Digest does one thing more: it brings you its information in a fast-reading form that cuts hours from your reading time.

Sincerely yours,

Harry S. Whalen

Editor

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AND
ROLLING STOCK
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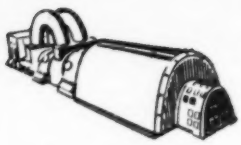
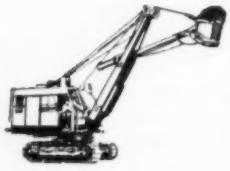


Electric Power Station & Sub-Station

Rolling-Stock



Cranes, Winches & Power Shovels

Telephones & Switchboards

Electric Tools

Malleable Iron Castings

Hitachi, Ltd.
Tokyo Japan

TECHNICAL SHORTS

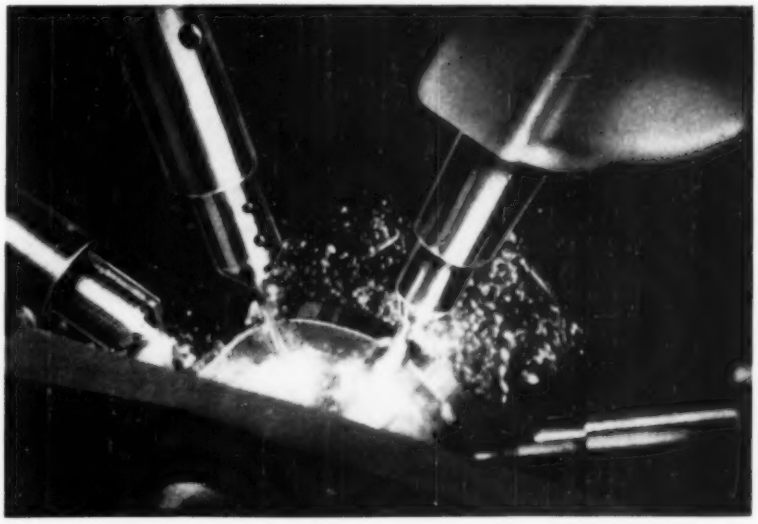
Riveting Aluminum — Aluminum Development Association, London, reports that 5 years of research has ended in successful riveting of large aluminum structures. Current applications are bridges, cranes, similar structures. Rivets are ¾-in. hot-driven and ½-in. cold-driven.—Prod Eng, May, p7

Radiant Heat Aids Printing—A metal lithographing press in a metal-clad building at New Orleans got so cold at night that ink viscosity on the rollers greatly increased, resulting in several hours' down-time each morning. Installation of a 12 x 16-ft. electric radiant-heat rubber panel above the press now maintains a 70°F. temperature, aids employee comfort, and eliminates down-time.—Elec World, May 31, p146

Photo Clarifier—An optico-electronic device, developed by National Bureau of Standards, uses an electronic tube to scan a weak photographic negative, sharpen up dim areas, and transmit improved image for reproduction on a second tube. Present model cost over $1,000; a commercial version might cost half that. Present uses: diagnosing disease, catching criminals, clarifying aerial photos.—Business Wk, June 5, p114

Peak Gas Demands—A new process, called hydrogasification, makes artificial gas by cracking natural gasoline with hydrogen added. The gas can be substituted for natural gas. East Ohio Gas Co. sponsored development work.—Pet Proc, May, p632

Packaged Air Conditioning—June Savings and Loan Co.'s offices in Cincinnati have an economical air-conditioning setup. The 11 packaged units are centrally controlled by a time-clock system. There are savings in water and electricity, plus less wear on equipment.—Am Business, May, p6



High-Speed Photography Pin-Points Trouble

Excessive tap breakage faced Gilman Engrg. Co., Janesville, Wis., in a prototype Indexomatic machine. This machine drills and taps eight holes by cam-feeding eight chucks with axial floating tap holders and combination drills. High-speed photography showed a near stall midway in the tapping phase of one spindle. Cause: insufficient tap clearance and a chip build-up. Solution: special taps with high-helix flutes.—Am Mach, June 7, p156

Electric Furnace—World's largest electric steel-making furnace has just been completed by U. S. Steel's American Bridge Div. for McLouth Steel Corp. Shell ID is 24½ ft., hearth depth 3¾ ft., height 14½ ft. Capacity is 200 tons. The three electrodes are 24 in. in dia.—Iron Age, Apr 22, p129

Shaves Last Longer—A shave that lasts 4 to 6 hr. longer is the claim for a new shaving soap. Two German firms, August Schaal (Stuttgart) and Vogelsang Werke (Lueneberg) will soon market the soap. Its ingredients are supposed to make the hair emerge from the skin so they can be cut shorter.—Chem Wk, June 5, p56

TV Store Detective — Three small television cameras, suspended 4 ft. below the ceiling of a California store, scan 22,000 sq. ft. of floor area, transmitting images to a battery of three receivers. Cameras, controlled at the receivers, can be completely rotated or turned downward at 45°. System is effective in spotting shoplifters.—Electronics, June, p198

"Sellavox"—A 3½x5-in. battery-powered record player, developed by Carter & Galantin of Chicago, fits into dummy quart automobile oil can and gives a sales talk on the canner's product.—Nat Petroleum News, May 26, p18

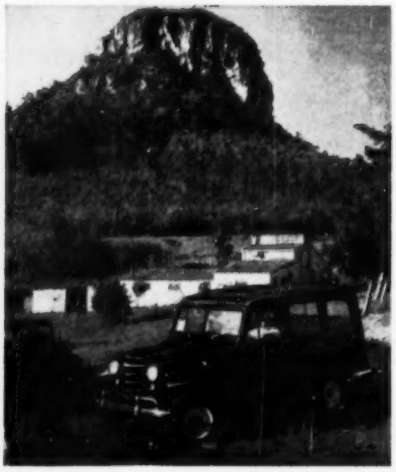
Engine Testing—California Research Corp. controls engine cycling tests with a perforated 35-mm. tape actuating an electronic instrument. The tape is "cut" on a stock car undergoing tests. When the tape is fed to the electronic control, it takes engine in laboratory through "road" test.—Oil & Gas J, May 24, p125

In BRAZIL...

as in Countries Throughout the World

WILLYS Brings Progress

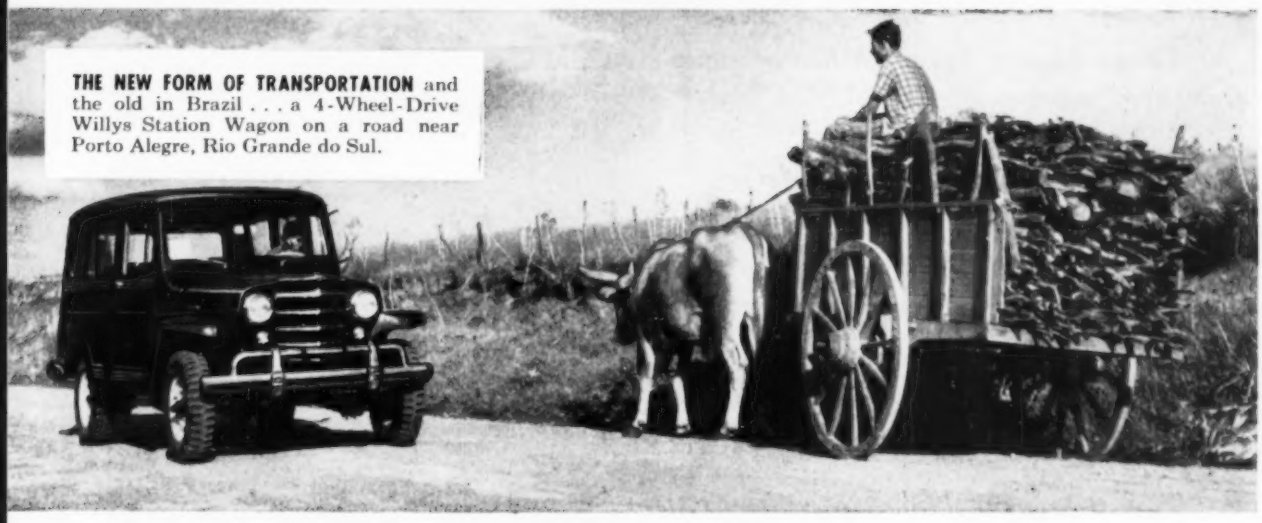
IN PRACA MAUA, Rio de Janeiro, a Willys Truck with a crane tows a disabled car. Extra traction of its 4-wheel-drive makes the Willys ideal for any kind of service work—on or off the road.



THE 4-WHEEL-DRIVE WILLYS STATION WAGON is actually two cars in one—a roomy personnel carrier of six passengers or, with seats removed, it provides over 100 cu. ft. of cargo space for hauling.

RUGGED TERRAIN, as in the background above, is no problem with the 'Jeep'. It climbs mountain trails and travels jungle paths where ordinary vehicles cannot go.

HOME OF BRAZILIAN 'JEEPS' near Sao Paulo—modern automotive plant of Willys-Overland do Brasil, S.A. The establishment of this plant not only makes possible the production of vitally needed 'Jeeps' with a minimum expenditure of dollars, it marks the first time a foreign automotive company has entered into a contract providing for ultimate manufacture of complete vehicles in Brazil. Construction of the plant was accomplished in a record-breaking time of 12 months.



THE NEW FORM OF TRANSPORTATION and the old in Brazil . . . a 4-Wheel-Drive Willys Station Wagon on a road near Porto Alegre, Rio Grande do Sul.

in Transportation —

The World's Most Useful Vehicles

IN AGRICULTURE, the 'Jeep' proves its renown as the world's most useful vehicle. Above, with disc attachment, it opens new ground on an orange and mamao fazenda.

'JEEP' VERSATILITY is demonstrated here in the operation of a buzz saw. This highly mobile unit can be moved quickly from one location to another, as the work requires.

Brazil is a big country . . . its immensity dwarfs the United States. In the main, Brazil skipped the age of railroads . . . today its basic land transportation is dependent largely on 'Jeeps'.

Probably more than any great nation in the world today, Brazil's expansion is proceeding at a seam-bursting rate. Its burgeoning frontiers from the jungles of Amazonas to the rolling plains of Rio Grande do Sul, require, as never before in the long history of Willys-Overland in Brazil, the on-the-road and off-the-road stamina of Willys 4-wheel-drive vehicles.

Indeed, there are whole areas in the vital, new developments in such States as Parana and Mato Grosso where nearly all vehicles registered bear the famous trade-mark . . . "Willys".

Such widespread acceptance is powerful proof of the superior advantages provided by Willys vehicles . . . their "go-anywhere" ability . . . versatility . . . economy . . . and inherent stamina. These are the reasons why Willys are *the standard utility vehicles of the world*. These vehicles are ready to serve you.

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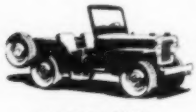


UNIVERSAL 'JEEP'

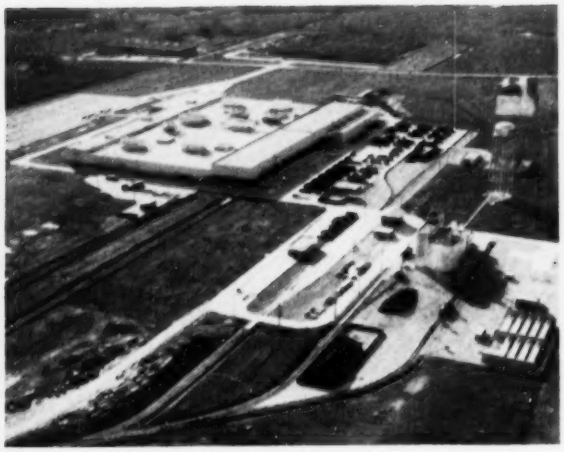
4-WHEEL-DRIVE WILLYS STATION WAGON

4-WHEEL-DRIVE WILLYS SEDAN DELIVERY

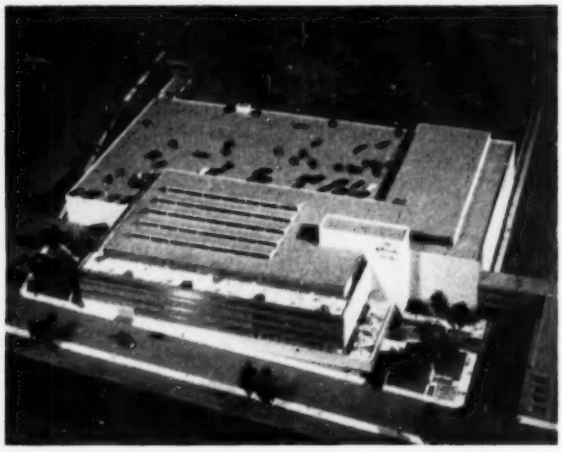
4-WHEEL-DRIVE WILLYS TRUCK

AERO WILLYS

These Plants Typify Management's Awareness of What New Materials



CATERPILLAR TRACTOR CO.'S two main buildings house "double-purpose" plant—manufacturing and storing.



HALLMARK CARDS' 1955 plant will overlay a steep and rocky slope that was uneconomical to level.

New Ideas for Better Plants

The latest in technology will go a long way toward making your plant a better plant. The ways of technology are entering into management's imaginative thinking

A NEW WAY of thinking is emerging among manufacturing executives. It's aimed at getting the best possible plant for the money spent. Management knows that equipment makes the product. But it also feels that it is not only the equipment itself, but how well it is housed and how well it is serviced that determine the efficiency of the manufacturing process. So new plants will incorporate the greatest amount of the latest technology that management's imagination and available money can provide.

Listed below are some technological developments that wide-awake management is considering. Some of them can fit into your plant.

1. Suspended offices at Lansing Bagnall, Ltd., England, save valuable floor space and keep supervisors close to plant operations. At Hall Printing Co., Chicago, island offices have movable steel panels. Offices can be disassembled and moved to a new location in a few hours.

2. Wall painting improved appearance and protects masonry at Cadillac-Cleveland Tank Plant. When mortar joints started to break up, management had joints covered with a rubber-base, alkali-resistant paint. First the contractor sandblasted the walls and mortared all cracks. Then he applied Cementhide (Pittsburgh Plate Glass Co.) with deep-nap rollers. Expected life is 4 to 5 yr.

3. For roof cooling, try a roof spray or roof pond. For a new roof, consider the pond. For an existing roof, the spray. But consult a good roofing contractor before using either.

4. Fire insurance costs were cut 85.8% at Templeton, Kenly & Co., Ill., by isolating hazardous areas —such as spray painting—from the rest of the plant by fire walls and fire doors.

5. Automatic doors at Pure Milk Co., Akron, speed up handling, cut down loss of conditioned air, keep storage temperatures constant. Stanley Magic Door operators are available in swinging, sliding, and folding doors. They are powered by compressed air and can be controlled by photocells, pullcords, pushbuttons, or floor plates.

6. Picking the right location is no small problem. The Cleveland plant of National Sugar Refining Co. is the country's first sugar packaging plant and warehouse to be located inland. National picked this site for speedier distribution to the Midwest.

Surrounded by steel mills, the plant is exposed to heavily polluted air. To offset this condition, the plant has aluminum siding for upper walls. Lower walls and office section are brick. Glazed tile provides for extra cleanliness of interior walls. The plant is completely air-conditioned to protect the process and to increase employee comfort.

7. New administration building for Ford Motor Co., Dearborn, Mich., is 12 stories high. Site covers 120 acres. It will be air-conditioned throughout. It will have movable interior partitions to provide maximum flexibility of floor arrangements.

and New Methods Can Do for It

C. P. CLARE & CO.'S new plant is located in a residential area. Handsome appearance makes it a welcome neighbor. Plant is windowless, unusually low.

8. Masonry walls can be protected with silicone-base waterproofing compounds. Masonry is kept drier, more attractive, cleaner. And effluorescence is reduced. Before you spray it on, make sure your windows are protected. It is almost impossible to get off.

9. Doors that can take plenty of abuse are available. American Hard Rubber Co., New York, makes a door that withstands assaults by fork trucks and other powered equipment. Called Durador, it is heavy-hinged, contains a shatter-proof window. It is made of plywood, armored with sheet steel, and given a tough covering of soft rubber.

10. Blow-out windows of extruded Tenite butyrate plastic have been installed by Emery Industries, Cincinnati, in a building housing a process that uses hydrogen. In an explosion, panes are flexible enough to bow and pull away from the sash before walls or sash can be damaged. General Plastics Co., Marion, Ind., makes the new panes.

11. Plastic-finished wall panels update Williamson Candy Co., Indianapolis. Called Marlite, these panels are made by Marsh Wall Products, Inc., Dover, Ohio. They come in sections 16 in. wide and 8 ft. long; or as blocks, 16 in. square. Permanent soilproof surfaces resist moisture, heat, and stains.

12. Porcelain-enameled, corrugated steel may be the remedy if corrosive fumes are giving your roof a hard time. One company, facing this problem with a painted galvanized roof, replaced it with V-CORR sheets supplied by Toledo Porcelain Enamel Products Co. The maker says a building's enameled parts will outlast its structural steel.

13. Glasfab added 10 yr. to the life of a 10-yr.-old roof at Cadillac-Cleveland Tank Plant. Glasfab is an open-mesh, rot-proof glass fabric made by Twinsburg-Miller Corp., Twinsburg, Ohio. Cost ran about $11.40 per 100 sq. ft. It included priming and conditioning the exposed areas, and application of Glasfab.

14. Mastic glazing compounds offer real advantages over traditional putties. But make sure the compound you use is stiff enough to retain the glass properly.

15. For a skylighting area of 4,025 sq. ft., the Henry Miller Spring Mfg. Co., Pittsburgh, used Resolite. This is a translucent polyester-resin sheet material reinforced with glass fiber. The Resolite Corp., Zelienople, Pa., offers it in corrugated and flat sheets.

16. Fire-retardant paints swell and char on contact with flame or excessive heat. And they provide an insulating blanket of non-combustible ash over the affected area. In a recent test of one such paint, Ford Motor Co. found one coat kept the temperature of the material it coated as much as 350°F. below temperatures of similar unprotected materials.

17. A lightweight fireproofing material gave Aluminum Co. of America a 4-hr. fire-rated wall at its new 30-story Pittsburgh headquarters. The building was first faced with aluminum panels. Then slotted aluminum lath and reinforcing bars were placed. Finally a plaster wall was built up by air-spraying onto the lath four 1-in. layers of lightweight Perlite concrete. Advantages: excellent thermal insulation, good resistance to fire and sound transmission, lightweight (35 lb. per sq. ft.).

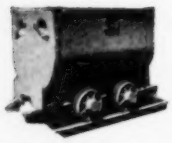
18. A new aluminum roof at Fort Pitt Bridge Co., Canonsburg, Pa., was applied with self-tapping screw fasteners. Aluminum roofing materials are now available from several manufacturers in several gages. Corrugated aluminum sheeting is suited to both new construction and re-roofing jobs. It can be used for inner sheets, outer sheets, or both, along with an insulating core.

19. New way to paint rusty surfaces comes from Surface Engrg. Co., Wichita 1, Kan. Materials include Rusty Metal Primer and vinyl-resin-base protective coatings. Primer contains red lead, iron oxide, and a chromate pigment blended in a vehicle that actually "wets" rust.

20. Will today's new plant be big enough tomorrow? If you think not, you will be smart to preplan an addition. Flexonics did when it put up a new building 3 yr. ago. It fitted one wall with columns to support the roof of an addition. And it built the same wall of Waylite Brick that withstands the weather, but can be razed quickly. Result: Flexonics saved time and money in erecting a new addition.

21. New kind of truss was used in H. J. Heinz Co.'s Tracy, Calif., warehouse. The truss has a wooden top chord (because of wood's compressive strength) and a steel bottom chord (because of steel's tensile strength). Joists, carried by the top chords, are supported by joist hangers. Joists and top chords are at the same level. —Factory, June, pB-6

Mainline Freight Cars



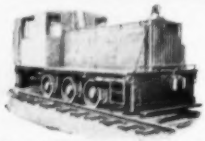
Dump and Industrial Cars

PRESSED STEEL CAR COMPANY

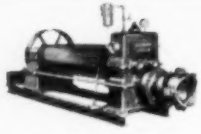
Cradle and Industrial Cars

Sugar Cane Cars

equipment which is establishing



Internal Combustion Locomotives



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PRESSED STEEL CAR CO., INC.

Quality-Control Plan Shows Performance

Motorola, Inc., has a new quality-control technique designed to single out the individual who does high-quality work and give him recognition among his associates. The technique employs a personal, eye-catching scoreboard at each position on the production line. The object is to detect errors or rejects in the radio and television sets while they are still in the production stage by making people conscious of their jobs.

Each line operator has his own scoreboard—a bright yellow plastic slate that hangs above his bench. Hooked to the front of the slate is the quality-control chart. This chart shows errors made for each hour the line operates.

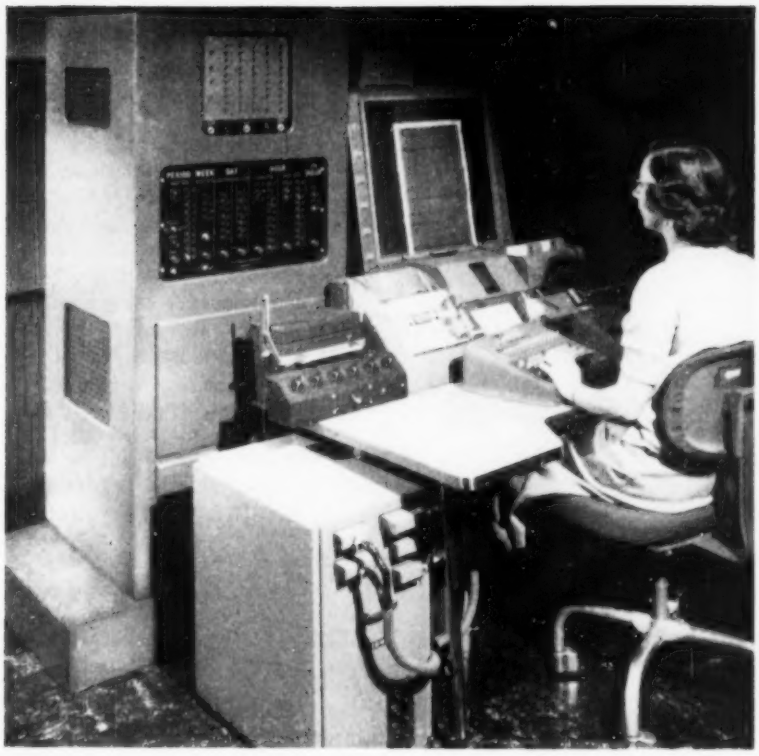
A group leader counts the individual's errors and scores them according to quality performance. Ratings, classified as excellent, good, fair, and poor, are marked on a plastic wheel fastened to the back of the slate. The wheel is spun to the position showing the operator's current rating. Motorola management credits the technique with a 50% cut in errors and rejects.—Am Business, May, p46

Construction Briefs

▶ **Brazil**—A 10-year program would triple present annual power output, raising it from 2.5-billion to 8-billion kw.-hr. It is planned to construct new power plants, to connect existing plants with one another as well as with new ones, and to standardize current frequencies.—May 27, p52

▶ **Peru**—New $1.2-million irrigation system covering 25,000 acres high in the Andes has been completed. System involves a 40-mile canal carrying about 3,000 gal. per sec. Technical studies and cost estimates for a projected power plant are underway.—June 3, p67

▶ **Pakistan**—International Bank for Reconstruction and Development will loan Pakistan $14-million toward construction of a $25.2-million gas pipeline. Most of Pakistan's industrial fuel needs will be supplied from Sui gas reservoir.—Eng News Rec, June 17, p66



OPERATOR READS film projected on screen, checks panel board, and controls card-punching operation. Standard machine is modified to do special work.

MASTER CARD on box of new cards helps clerk keep perpetual inventory.

Machines Cut Costs

Mechanizing repetitive office jobs allows sizeable savings. Where needed, special equipment helps standard machines do particular job

MECHANIZATION of routine clerical jobs has broken many bottlenecks at A. C. Nielsen Co. Nearly every department has projects underway that speed production and cut costs. And the company has demonstrated that you can alter standard machines to fit your particular problem.

Nielsen does market research. It provides confidential reports for clients—who may be manufacturers, their advertising agencies, or radio and television stations and networks. Manufacturers may be interested in how their product is selling in grocery or drug stores, or they may want to know how their advertising program is faring on radio or television.

Nielsen's job consists mostly of handling figures. Besides the usual tabulating equipment, it also makes use of eight electronic calculating machines.

To meet its own needs, the company modifies some of the standard machines. Its key-punch setup using an International Business Machine 204 punch is a typical example. Two arrangements are used: (1) cards punched from information projected on a screen from film, (2) cards punched from information read from a tape.

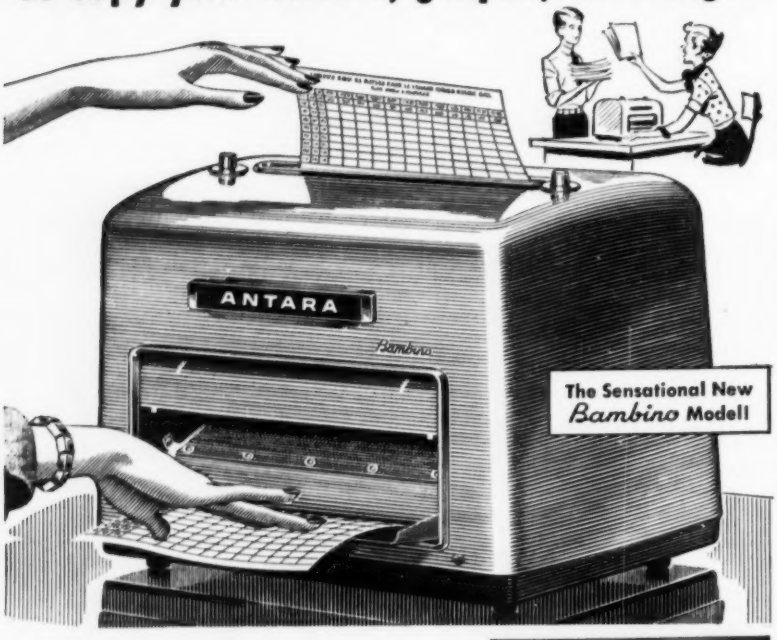
The operation is actually automatic film or tape decoding. Nielsen has added to the standard key-punch a unit containing step-relays that are indexed by the movement of the tape or film as it

COLORED LABELS identify millions of punched cards for easy reference.

The new, compact, **COPYING** machine by

ANTARA

to copy your letters, graphs, drawings!



Instant copies! Errorless copies! Now you can produce them easily on the small, compact copying machine made by ANTARA to fit into any department, taking only the space of a typewriter . . . and taking the place of re-typing and checking! The new machine will reproduce anything that is typed, ruled, written or drawn on translucent paper.

In seconds, this new ANTARA produces copies that are amazingly clear and legible . . . 200 copies per hour! (Cost per copy is a fraction of the price you pay for your daily newspaper!)

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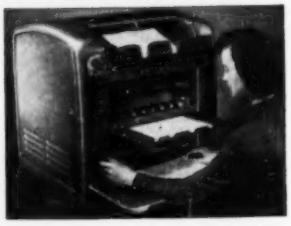
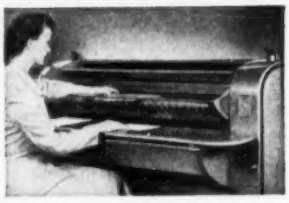
Graphs	Manuals	Records
Orders	Memos	Reports
Forms		Budgets

Engineering Drawings





Also for industrial use: the large desk-top model, the ANTARA **O-M** . . . copies up to 16" wide (40 cm.) . . . or the upright model, the ANTARA **Streamliner** . . . copies up to 42" wide (106 cm.).

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passes through the scanner. These step-relays cause the 204 to punch the appropriate information.

Nielsen has designed its own "station pin box." It allows the key-punch operator to depress a single key, instead of a number of keys, in order to enter a five-digit code in the punching sequence.

Certain radio and television sets throughout the U. S. record families' listening habits. The key-punch department keeps a master card on hand containing codes for the stations normally received by each of these sets.

When the tape or film record for that particular set is received in the key-punch department, the operator merely selects the proper master card from the file and inserts it into the station pin box. The operator then has available, for decoding, the codes for the stations recorded on tape or film.

Nielsen now uses IBM Cardatypes to prepare its final reports. Formerly, the reports were typed from information provided by runing cards through a tabulating machine. That meant not only extra labor, but also careful proofreading to prevent errors. The cards now go into the Cardatype and the reports are automatically typed on masters.

Special Cardatype circuitry was developed by Nielsen to permit hand typing of special information. The machine automatically stops and the operator adds the special information. Then she restarts the automatic typing.

Nielsen's savings fall into two classifications: (1) mechanization of operations incident to compilation of the report data (key punching, tabulating, computation) and (2) improvements in the methods of report preparation, including internal printing of the final product.—Am Business, May, p10

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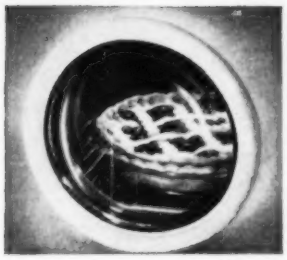
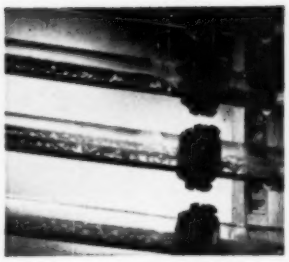


1 Transparency

You can let customers see inside your product through glass. A good example is the Corning brand oven window that *stays* crystal clear.

It's easy to keep clean.

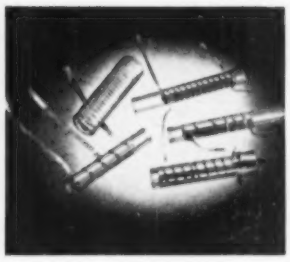


2 Corrosion Resistance

If your product must cope with corrosive liquids or atmospheres, glass will improve its operation, lengthen its life. It's the world's most corrosion-resistant material. The severe service Corning brand pipe stands in chemical plants illustrates the point.

3 Heat Resistant

Where your problem is heat or quick changes from hot to cold, Corning brand glass No. 7740 will stand temperatures below zero to 250° F. VYCOR brand glasses go to 1800° F. Picture shows pouring hot metal into VYCOR dish on cake of ice.

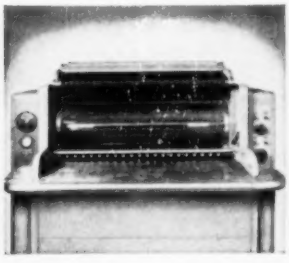


4 Electrical Stability

Metal bonded to glass forms which have high dielectric strength and low temperature coefficient makes inductances and capacitors of exceptional stability. Electronics industry uses tens of thousands of the glass inductances shown in the picture.

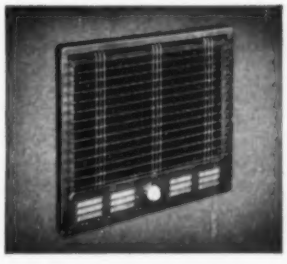
5 Hermetic Enclosure

Glass forms perfect glass-to-glass or glass-to-metal seals for vacuum-tight applications. Vacuum bottles are a good example. So are TV tubes and sealed beam headlights.



6 Light Transmission

Glass can accurately control and transmit light with permanent reliability. Good examples are all around you but one rather unusual one is the glass cylinder in this printing machine. It transmits the ultraviolet rays produced by a mercury arc lamp.



7 Heat Generation

Although you normally think of glass as an electrical insulator, Corning's E-C glass conducts electricity and radiates heat. E-C glass is ideal for space heaters, dryers, and other applications especially where an *even* heat distribution is wanted.

8 Photosensitivity

Designs reproduced photographically in Corning's special photosensitive glass cannot fade or wear off. They are ideal for permanently reproducing nameplates, photographs, artwork and offer a variety of design possibilities.

8 properties of glass to help you make better products

These eight properties give you only an indication of the versatility of glass by Corning.

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Make Your Welding Safe

The human element, principal cause of welding and cutting fires, can be controlled and educated to reduce the number of these unnecessary fires

FIRE PREVENTION was of top interest at the recent Chicago meeting of the International Acetylene Association. Much of the interest stemmed from last year's disastrous fire at a General Motors plant.

An analysis of 92 fires attributed to welding or cutting showed the average loss to be $200,000 per fire. This loss is much higher than the average loss of $2,400 for fires set by professional arsonists. Everyone of the 92 fires was caused by uncontrolled use of mobile equipment.

Sparks cause 90% of welding and cutting fires. Flying sparks, after traveling 25 ft., retain enough heat to set fire to combustible materials. Other fire causes are acetylene leaks and flashbacks. Oxygen leaks are much less likely to cause fires than acetylene leaks, but they can prove disastrous when they release oxygen into confined quarters.

Portable equipment, one speaker pointed out, causes 80% of the fires. Portable cutting equipment causes about 65% of all welding and cutting fires.

Prevention of such fires must be approached in several ways. A logical one is to make sure that combustible material is not within range of flying sparks. Another step in the right direction would be to require a written permit for any welding or cutting operations outside the regular welding areas.

Even more important is education of weldors. The welding industry in the U. S., together with fire-prevention associations, have made available to the industry a long list of publications on safety precautions. Among them, together with publishers and their addresses, are the following, for which nominal charges are made:

"Preventing Welding and Cutting Fires"—International Acetylene Association, 30 East 42nd St., New York, N. Y.

"Safe Practices for the Installation and Operation of Oxyacetylene Welding and Cutting Equipment"—International Acetylene Association, 30 East 42nd St., New York, N. Y.

"Safety in Electric and Gas Welding and Cutting Operations" —American Welding Society, 29 West 39th St., New York, N. Y.

"Safe Practices for Welding and Cutting Containers That Have Held Combustibles" — American Welding Society, 29 West 39th St., New York, N. Y.

"Preventing Welding and Cutting Fires"—National Fire Prevention Association, 60 Batterymarch St., Boston, Mass.

A second topic of high interest was welding of castings. The experience of one company, which salvages 25,000 castings a year, was described to show how unorthodox practices, when backed by sound reasoning and knowledge, can be successful.

Its operators, for example, do not follow the textbook recommendations of using a deep double V for cast-iron weld preparation. Instead, they get sound welds with a wide and shallow U on each side of the break. Also, they start at the end of the crack and weld toward the opening, whereas almost universal practice is to weld toward the end of the break.

Neither do they practice extensive preheating before repairing cracks and breaks. Eliminating preheating before brazing cast iron reduces distortion. Operators control stresses by proper welding procedures; they make sure that all parts are properly bonded and always break up long, straight stress lines.

Also described at the meeting was a new hot scarfing machine that can condition four sides of a steel slab at a time. The operator, working at a control panel in an enclosed booth, can adjust the machine to the proper slab size and change the depth of cut by varying table speed or pressure of the cutting oxygen. Scarfing heads move out as soon as a slab has been scarfed.—Weld Eng, June, p33

Low-Cost Steel Coating

High-nickel, low-phosphorus alloy, coated to any thickness on mild-steel vessels and piping, gives the steel corrosion-resistant properties comparable to that of some stainless steels. Nickel oxide forms on the surface at a temperature much lower than the melting point of either steel or nickel.

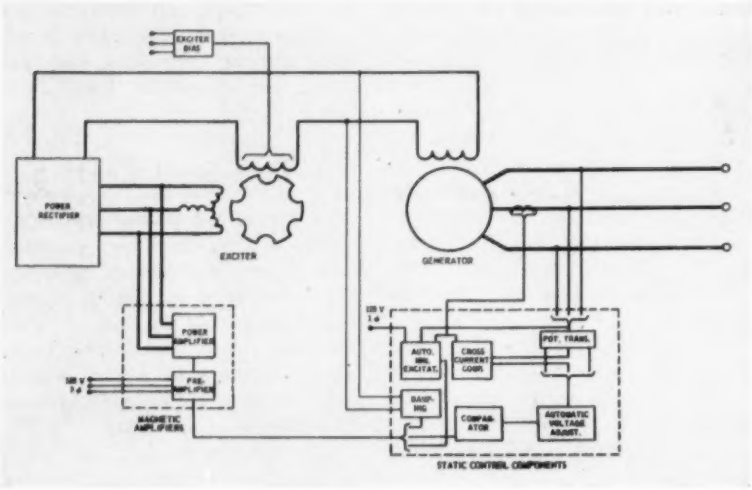
The Niphos coating, developed by New York Testing Laboratories, Inc., is a mixture of nickel oxide, dibasic ammonium phosphate, and water. It can be applied by brushing, dipping, or spraying with conventional equipment.

The coating is then fired at 1600 to 2000 F. in a controlled-atmosphere furnace. Firing time is short as only the skin need be brought up to temperature. Material and application costs are low.—Iron Age, Apr 15, p125

Glare-Free Lamp

Physical and mental fatigue among sewing machine operators is virtually eliminated through use of a glare-free lamp designed by Paul Hart of Southern California Edison Co. Lamp consists of two 50-w. bulbs mounted in a sheet-metal hood. Good diffusion is obtained through a plastic shield. Glare from shiny metal parts, shiny fabrics, metallic threads, etc. is reduced.—Elec World, May 3, p120

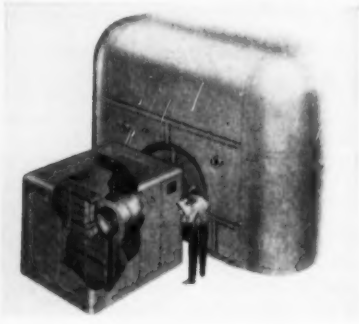
NEW PRODUCTS



New Inductor Excitation System Cuts Generator Maintenance Costs

New exciter system for generators eliminates brushes and commutator of the conventional exciter, as well as all rotating windings, by substituting an inductor alternator for the usual d-c. machine. It is available as original equipment with turbine-generator units or can be applied to modernization of old units.

Power for excitation is generated at high frequency and then changed to direct current by a bank of selenium rectifiers. The rotating element of the new a-c. exciter is adaptable to overhung mounting on most 3600-rpm. generators, in which case couplings, gears, and extra bearings are eliminated.



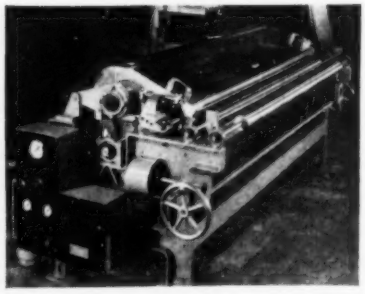
The heart of the new system is the 360-cycle inductor generator, which has no windings, commutator, or slip rings. The inductor alternator type exciter is under the control of magnetic amplifiers through a circuit sensitive to the main-generator terminal voltage.

The inductor generator has inherently high reactance and is especially sensitive to lagging-power-factor loads. The control signal to the magnetic amplifier is obtained from potential transformers on the main-generator terminals through a comparator circuit and a magnetic preamplifier. Output of the main generator is controlled with a high degree of amplification by using the magnetic amplifier as a variable reactance load.

Outstanding advantage of the development is that two major causes of steam-turbine-generator outages — commutator maintenance and brush replacement — are eliminated. — **Allis-Chalmers Mfg. Co., Milwaukee, Wis.**

Hook-On Volt Ammeter

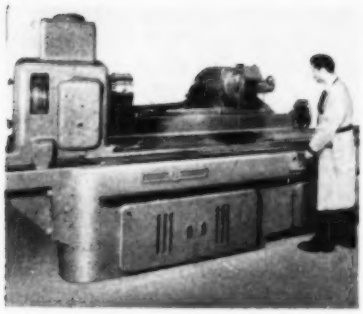
Pocket-size AK-5 hook-on volt-ammeter is believed to be the first equipped with automatic scale-changing. This feature eliminates the possibility of reading the wrong scale for the application. Current range is 5/20/80/350 amp. It also measures ac. voltage in three ranges (150/300/750) without auxiliary equipment.—**International General Electric Co., 570 Lexington Ave., New York 22, N. Y.**



Size Applicator Cuts Costs

Griffin Size Applicator is called an applicator because it does more than an ordinary size box. It prevents congealing of size on exhaust fans, hoods and ductwork and eliminates slasher cloth changes and dilution and breaking down of size. It also keeps floating fibers from getting into the size pan.

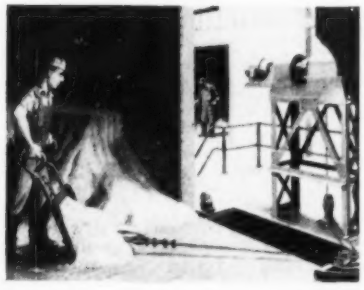
Because the size pan has a small volume, waste is reduced up to 50%. The reduction in waste is said to pay for the applicator in 1 to 1½ yr.—**Ira L. Griffin & Sons, Box 1576, Charlotte, N. C.**



Shaves Spur, Helical Gears

Red Ring model GCJ-36 finishes teeth on spur and helical gears with up to 36-in. pitch diameter and having shafts up to 142 in. long. Crowning of tooth surfaces on spur and helical gears up to 12 in. wide with shafts to 62 in. long can also be done.

Assemblies can be mounted on shaft centers. Or machine can be equipped with work driver to enable gears to be shaved while rotating on the journals on which they will run.—**National Broach & Machine Co., 5600 St. Jean Ave., Detroit 13, Mich.**



Automatic Power Scoop Unloads Box Cars Rapidly

One man can unload bulk materials from box cars safely and quickly with a new power unloader. Another use is to reclaim materials from inside storage areas.

The unloader consists of a power unit mounted alongside of the railroad track and a scoop connected by a steel cable to the power unit. The units itself consists of motor, clutch, drum, and limit switch; it provides a 1,500-lb. pull to the scoop. Rope speed is 180 ft. per min.

The unloader is controlled from a lever in the scoop handle. It's a dead-man type of control so that the scoop stops automatically when the operator releases the lever, whether intentionally or accidentally.—**Jeffrey Mfg. Co., Columbus 16, Ohio.**

Shallow-Draft Tug

New-type welded steel tug or utility boat is designed for operation in very shallow rivers and canals. It features two engines driving twin screws operating in special side entrance tunnels. Thus it avoids operating difficulties in shallow water encountered with a conventional bottom entrance tunnel.

Twin diesel engines have a total of 76 hp.—**Murray and Tregurtha Inc. Quincy 71, Mass.**

Gage Checks Seven Points

Electrical multiple gage, the Multicheck, inspects seven critical dimensions on a shell body at one setting, with the operator having only to load and unload the part. When the work is put in place, a master light on the panel remains white if all seven dimensions are within the proper tolerance limits.

If one or more dimensions are out of tolerance, the master light turns red and the respective signal lights turn red or green to indicate undersize or oversize. Signal lights at correct dimensions stay blacked out. Inspection is rapid and accurate.—**Sheffield Corp., Dayton 1, Ohio.**

Sand Washing and Screening Plant Is Portable

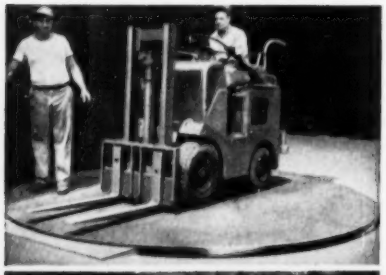
Completely portable sand washing and screening plant is designed for production from sand bars or gravel pits and washing and separating precrushed aggregate. Called 412-VW, plant features a large vibrating screen to ensure accurate separation and a long twin-screw dehydrator to wash the material thoroughly and squeeze out dirt and impurities. Total capacity of plant is 100 to 150 tons per hr. Two sizes can be produced, sand and coarse aggregate. Plant is mounted on pneumatic tires. All conveyors are fully supported on the plant and fold for travel along a highway.—Pioneer Eng'rg. Works Inc., Minneapolis 13, Minn.

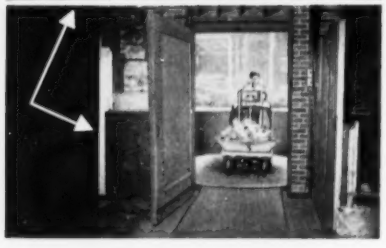
GLOBE OiLIFT® speeds materials handling in a steel plant

The loading dock of an iron foundry is almost four feet higher than the floor level inside. What's more, fork trucks moving along the narrow dock must make a right angle turn to get through the plant doorway. A ramp couldn't solve the problem because it not only would take up too much room, but would leave unsolved the problem of making that sharp turn.

The foundry solved its problem by installing a Globe OiLIFT in which the hydraulically-powered steel platform is combined with an automatic rotating device. As the platform rises, it turns counter-clockwise in an arc of approximately 90 degrees to "aim" fork trucks down the outside length of the loading dock (upper photo). As the platform lowers, it rotates clockwise, so that at the lower plant-floor level the front of the truck is pointing through the doorway (lower photo).

Every day, all over the world, GLOBE OiLIFTS solve problems of lifting, loading, positioning, and materials handling. Use the coupon to get the GLOBE story.





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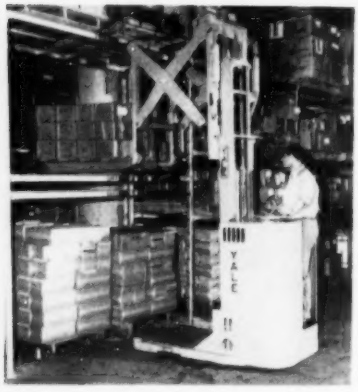
Microfilms Office Data

New low-cost microfilming machine combines recording and reading in one compact, portable unit. It will record documents smaller than bank checks up to single sheets 11 in. wide and 3,700 ft. long, photographing both sides. The machine will photograph documents intermixed in size just as fast as they can be fed into it.

Machine may be used to reproduce facsimiles of any filmed document without a dark room. Sensitized paper is exposed under the reader hood and can be developed under ordinary office-light conditions. The machine is made by Bell & Howell Co. and sold by Burroughs Corp. — **Burroughs Corp., Detroit 32, Mich.**



Truck for Restricted Space

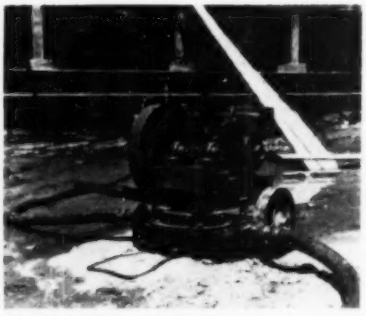
New electric fork truck operates easily in a 7-ft. aisle and can pick up and deposit loads without straddling pallets or skids. Called Warehouser Extend-A-Load it has 2,000-lb. capacity at 24-in. load center. It can turn in a short radius and it can reach out and pick up or deposit a load at any height from floor level to 126 in.

Fork spread is adjustable from 12 to 26½ in. A powered pantograph device extends and retracts loads hydraulically. Controls are grouped for one hand operation.— **Yale & Towne Mfg. Co., 11000 Roosevelt Blvd., Philadelphia 15, Pa.**

Cellulose for Better Rayons

An improved type of cellulose has been developed for use in high-stretch rayon-spinning techniques. Called Rayocord-X, it makes possible high-tenacity rayon yarn for tire cord with superior strength, and staple fiber and yarn for viscose rayon fabrics with improved properties.

The new material is a high alpha cellulose made by the sulfite process. The process imparts high strength, resistance, and toughness to the filaments regenerated from solution. — **Rayonier Inc., 161 East 42nd St., New York 17, N. Y.**



New Lightweight Pump Controls Muddy Seepage

Diaphragm-type pump is designed for muddy or sandy ditch work. It is self-priming and operates on suction lifts up to 20 ft. It can be used with total liquid heads up to 40 ft.

Design features include a horizontal chain drive to reduce pump size and make it more rigid; heavy-duty bearings to support pump shaft on both sides; changing of diaphragms by loosening only four bolts and lifting the handle.

Two sizes are available. Model 202A with 2-in. hose handles up to 3,000 gal. per hr.; model 302A with 3-in. hose handles 3,300 gal. per hr.—**Marlow Pumps Div., Bell & Gosset Co., Ridgewood, N. J.**

NEW PRODUCT BRIEFS

Portable Radial Saw—New portable 10-in. radial saw combines the accuracy and versatility of a radial saw with the mobility of a portable electric saw. Detachable handles make carrying easy. Saw will crosscut full 16 in. in 1-in. stock and rip to center of a 48-in. panel.—**Rockwell Mfg. Co., 400 Lexington Ave., Pittsburgh, Pa.**

Aluminum Roofing—New aluminum roofing and siding product reduces by 50% the amount of metal normally used in side laps with convential metal sheets. Two 12-ft. lengths of the product, called 8-V crimp, make one square. The 8-V crimp is available in 0.019-in. and 0.024-in. sheets.—**Reynolds Metals Co., International Div., 19 E. 47th St., New York 17, N. Y.**

Hydrophilic Starches—Carboxymethyl starches have excellent film-forming properties, which retard penetration of oily materials. Potential uses: calendar application to improve gloss-ink printability of boxboard, as barrier film on wallboard, in tub sizing.—**National Starch Products, Inc., 270 Madison Ave., New York 16, N. Y.**

Portable Tape Recorder—New model "600" Apex portable magnetic tape recorder weighs only 26 lb. but reproduces the full range of audible sound (30 to 15,000 cycles per sec.) at a tape speed of 7½ in. per sec.—**Rocke International Corp., 13 East 40th St., New York 16, N. Y.**

Hinged-bridge Goggles—Unique hinged bridge makes one size of safety goggles fit all faces—broad or narrow, long or short, with complete comfort. It allows the Contour-Spec to adjust automatically for any bridge width from 18 to 26 mm. — **Willson Products, Inc., Reading, Pa.**

Wheel-conveyor Tires—Neoprene tires for gravity-conveyor wheels safely handle fragile materials. Tires also absorb shock and cut handling noise. They can be installed on curved and straight conveyor sections.—**Rapids-Standard Co., Inc., Grand Rapids 2, Mich.**

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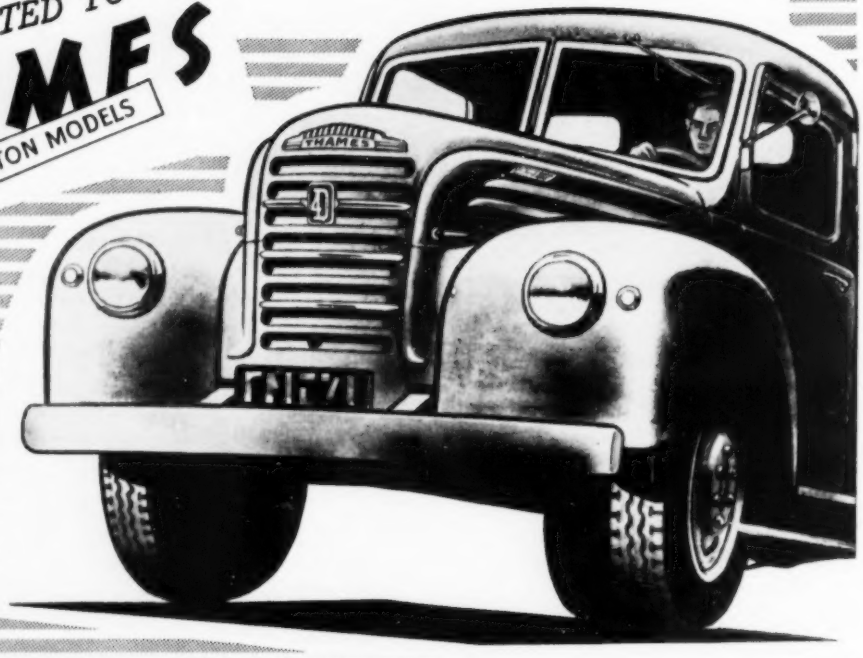

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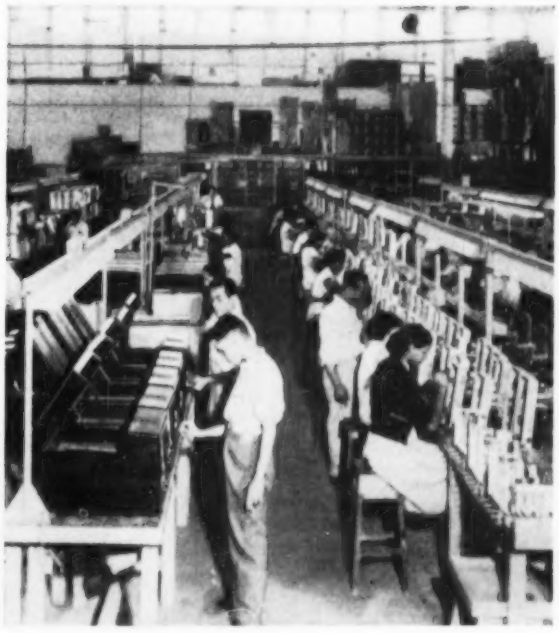
TELEPHONE LINES in Cuba . . .



RADIO ASSEMBLY in Brazil . . .

Both Help Make Up IT&T's Complex System of . . .

World-Wide Communications

International Telephone & Telegraph, unequaled among American companies for diversity of international operations, looks forward to a future of steady growth.—An original Digest article

THE BUSINESS MAN in Bombay, Cairo, or Paris neither knows nor little cares that this year in May a 10-year construction program ended in Brazil when the last of 22 cities was linked in a national radiotelephone network. But he does know and care that he can pick up his telephone and send a cable or a radiotelegraph message to order, say, a half dozen fork trucks or business machines or even diesel engines from the United States.

Nor does he know that the radiotelephone network in Brazil and the cable line or the radiotelegraph circuit over which his messages go are both part of a world-wide plan that started only 34 years ago.

Even before that, Colonel Sosthenes Behn and his brother, Hernand, owned telephone companies in Cuba and Puerto Rico. But in 1920, the brothers began building their operation, first by making a deal to get half interest in a cable laid between Cuba and the U. S. and then by forming the International Telephone and Telegraph Corp. Colonel Behn is still chairman of IT&T.

From that beginning, IT&T growth was spectacular. Four years later, Behn battled for and won the concession to operate Spain's telephone system. But the concession required that manufacture of telephone equipment be undertaken, with a view to the ultimate provision of facilities and trained personnel capable of supplying the needs of the Spanish telephone system. So IT&T, to gain a manufacturing subsidiary, bought International Western Electric from the American Telephone & Telegraph Co.

Within the next 10 years, IT&T bought or built telephone systems in Argentina, Brazil, Chile, China, Mexico, Peru, and Romania. Argentina, Spain, and Romania later took over their own networks.

Most of these systems were operated entirely by land lines. But IT&T linked South America with Spain in 1929 and with North America in 1930 by radiotelephone. And soon after, it linked

remote localities in Chile by radio.

Where does IT&T now stand? It's an American company with a truly international outlook. It manufactures electronic equipment, it operates telecommunication services. The International system, with associate companies, includes:

- Thirty-two manufacturing companies with 72 plants and 11-million sq. ft. of floor space in 19 countries.
- Three central laboratories in three different countries.
- Twelve telephone, radiotelephone and radiotelegraph companies in seven countries.
- A cable and radiotelegraph system linking the U. S. with the rest of the world.
- Three marine radio companies that manufacture and operate shipboard communication equipment, operate shore stations for communication with ships at sea, and maintain service depots or agencies in 181 seaports.
- An export organization with hundreds of sales outlets.
- A trading subsidiary engaged in importing into the U. S.

Let's take a closer look at IT&T's activities in various countries. Its factories employ about 82,000 persons—70,000 of them outside the U. S. Over 14,000 more work in communications and miscellaneous jobs.

Its largest manufacturing organization in the U. S. is the Federal Telephone and Radio Co. Federal, which multiplied its sales by nearly 20 times during the war, emerged as one of America's leading electronic manufacturers.

While still busy on U. S. government work, Federal is manufacturing an imposing list of commercial products: complete automatic telephone systems, selenium rectifiers, wire transmission equipment, complete radio relay communications systems, cable, vacuum tubes, radio aids to aerial navigation, and mobile radio for vehicular and railroad use. Last year, for instance, saw the completion of more than 4,000 route miles of Federal's pulse time modulation microwave radio relay links.

IT&T manufactures telephone equipment also at the Kellogg Switchboard and Supply Co., principally for the independent telephone companies in the U. S. Kellogg also sells abroad; last year, for example, it supplied crossbar exchanges to Puerto Rico and Japan.

Two divisions in the U. S. manufacture consumer goods. Capehart-Farnsworth Co. makes television receivers, radio-phonograph combinations, small radios. Coolerator Co. makes refrigerators, freezers, and room air conditioners. Capehart-Farnsworth also is developing and manufacturing special equipment for the U. S. government in armament control systems, guided missiles, tubes, and test equipment.

Overseas factories, managed locally by country nationals, are supervised from New York by IT&T's subsidiary, the International Standard Electric Corp. It centralizes management authority for 22 other subsidiaries located in 16 foreign countries. It also operates an export organization and a trading company that promote sale in the U. S. of products manufactured in IT&T plants abroad.

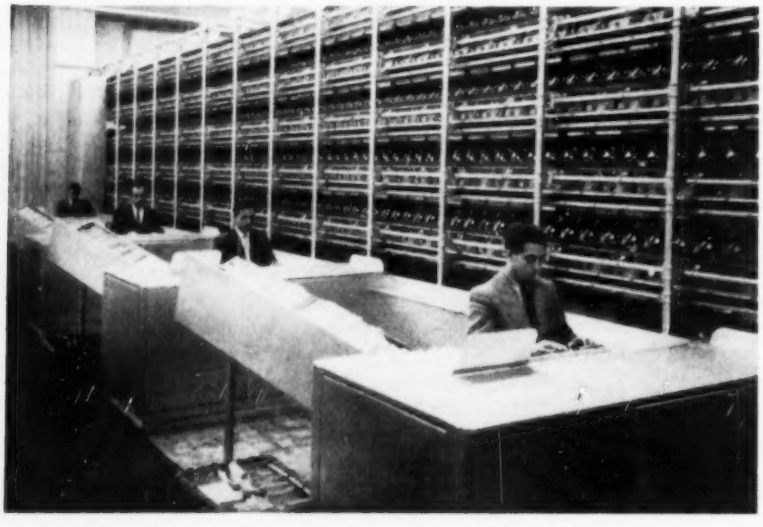
What do these plants make? The variety of products and their complexity astound observers of the IT&T system. As in the U. S., principal products are related to the communication fields—dial automatic telephone switching and signaling, long-distance switchboards, subscriber equipment, radio and television broadcasting and receiving, mobile communication, navigational radio aids, and others.

IT&T factories manufacture various designs of dial automatic telephone switching equipment, including crossbar, rotary, step-by-step, R-6 and Relaymatic. Different designs are needed to meet the varying needs of the telephone companies in many different countries.

Rotary equipment, developed by Bell Telephone Manufacturing Co. of Belgium, is also made in IT&T plants in Denmark, France, Holland, Italy, Norway, Spain, Switzerland, and the U. S. Over 4-million lines are in use in 32 countries. Other equipment is manufactured on a similar multi-country basis.

The company manufactures step-by-step equipment, for example, in Argentina, Australia, Austria, Great Britain, Western Germany, Italy, and the U. S. Thus, IT&T's experience in designing and producing equipment of the same and similar types in several countries has contributed to the company's progress in supplying the high-quality, modern equipment in use in so many countries—probably in yours.

Here are a few examples of this



MAIL SORTER in Belgium, manufactured by its Belgian subsidiary, Bell Telephone Mfg. Co., illustrates the range of IT&T's electromechanical and electronic products. Israel too is speeding mail operations with automatic sorters.

modern equipment: Belgium ticket-meters time and zone charges with IT&T equipment. Holland and Switzerland employ IT&T equipment for repeated metering that differentiates areas, distance, and time. Norway uses ticket printing for long distances and repeated metering for shorter distances. Finland enjoys national dialing with IT&T's four-wire transit switching system. All these developments contribute to just one thing—better, faster telephone service for you.

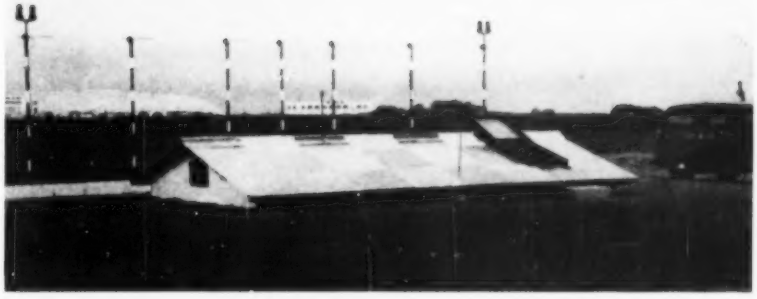
That is true too for IT&T's other telephone equipment. Amsterdam, Bologna, Brussels, Buenos Aires, London, Madrid, Mexico City, Rome, Zurich—these and other cities channel your long-distance calls through IT&T switchboards and over IT&T cables.

Standard Telephones and Cables, Ltd., London—International Standard Electric's largest subsidiary—has made the cables and carrier equipment for much of Europe's long-distance network, and for Australia and South Africa too.

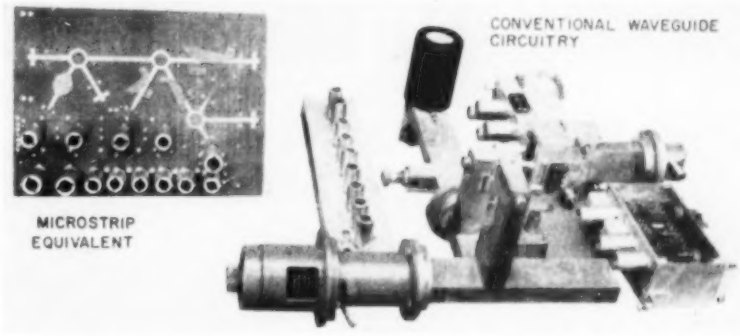
An IT&T subsidiary may have made the handsets in your home and the private branch exchange and even the teleprinter in your office. Over 70,000 teleprinters, made by another English subsidiary, Creed & Co., Ltd., are operating in 81 different countries and territories. Throughout Europe are distributed teleprinters made by one of IT&T's German subsidiaries, C. Lorenz of Berlin and Stuttgart.

In radio communication too, IT&T pioneered—in point-to-point radiotelegraphy on land and from shore to ships at sea and in trans-Atlantic radiotelephony and commercial radiotelephone service to ships. Microwave telephony has been especially well accepted—by governments; utilities; petroleum, gas and pipe-line companies; airports; and television stations.

IT&T's background in microwave communication encompasses more than 20 years in research and manufacture. Two important milestones: in 1931, the first successful demonstration of radiotelephone communication by microwave across the English Channel; and, in 1933, the inauguration of the world's first commercial microwave circuit—between government airports at Lympne, England, and St. Inglevert, France.



INSTRUMENT LANDING SYSTEM at Lima's airport in Peru was made by Federal Telephone & Radio. This is equipment for left-right guidance.



MICRO-STRIP, a revolutionary microwave wiring method that gives a 10 to 1 weight reduction at a lower cost, is one of IT&T's many research developments.

Now, 20 years later, modern microwave equipment permits the operations engineer to transmit simultaneously over a single radio beam his voice, teleprinter or telegraph messages, and instructions for closing a switch or valve hundreds of miles away. And it can bring him return telephone messages and readings of meters and sensing devices at remote installations.

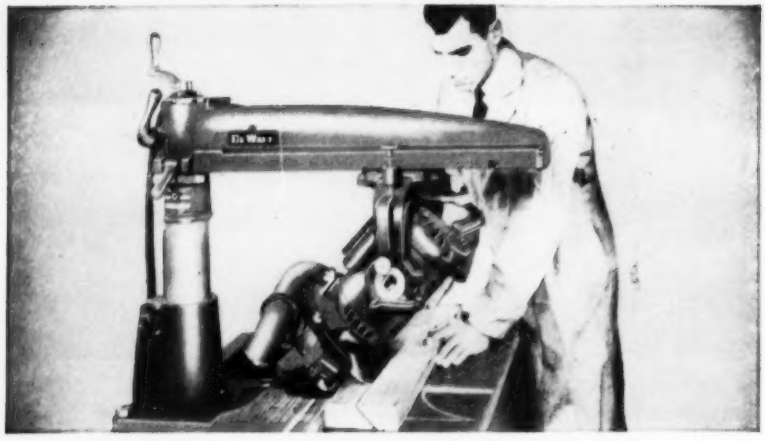
To radio and television transmission, IT&T is a familiar name. Europe, America, and Australia listen to radio broadcasts from IT&T-built stations. In Great Britain, Standard Telephones and Cables, Ltd., linked London to Edinburgh and Glasgow for television.

The U. S. research division, Federal Telecommunication Laboratories, has built complete television transmitting stations for Buenos Aires, Sao Paulo, and Tijuana in Mexico, as well as for cities throughout the U. S. IT&T companies in Argentina, Belgium, Brazil, Britain, France, Germany, and the U. S. are making television receivers.

Mobile communication has not been neglected by IT&T. Factories in nine countries manufacture or assemble mobile radio equipment for communication between points on the ground or between ground and air.

Sixteen American railroads and one in Saudi Arabia use the Federal-Farnsworth vhf (very-high-frequency) railway radiotelephone system. The most comprehensive of such installations consists of 50 wayside stations and 151 mobile radio stations on the Erie Railroad. It permits conversations between (1) cab and caboose crews, (2) crews of different trains, (3) trains and wayside stations, and (4) adjacent wayside stations.

A complete list of IT&T products is much too long to note. Those not already mentioned in-



All-purpose DEWALT® *Saws*

...every time you change the cutting tool you have another machine!

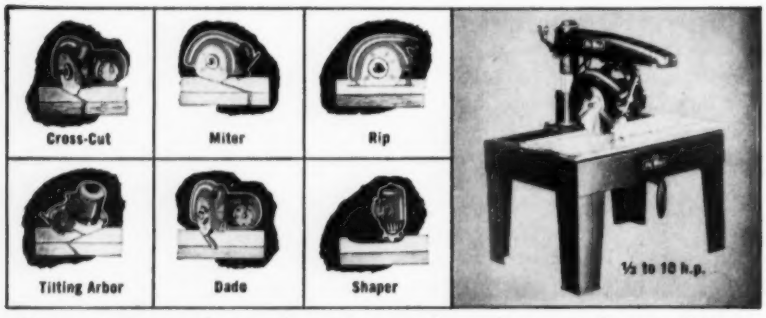
DeWalt is the world's most popular power saw, with over 100,000 now in use.

Because of their *unlimited flexibility*, DeWalts are being used for all types of construction, for public works projects—and for literally hundreds of uses in the woodworking, metalworking and plastics industries.

They are essential to any industrial plant for plant maintenance, pattern making, and boxing and crating.

The all-purpose DeWalt is many machines in one for the price of one. Changeovers from one job to another are easily and quickly made simply by changing the cutting tool.

In every part of the world, DeWalt users are cutting costs—with speed, accuracy and safety.



Every time you change the cutting tool you have another machine!

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clude instrument landing systems for airports, radar, omnidirectional equipment for aircraft navigation and control, electronic inventory equipment, remote indicating systems for substation or circuit-breaker control, many other kinds of electronic equipment, and a variety of electrical appliances.

Altogether, manufacturing accounts for about 92% of IT&T's gross income. Its telephone and radio operations account for the rest.

The company operates somewhat over 400,000 telephones in Brazil, Chile, Cuba, Peru, and Puerto Rico—few indeed compared to the many millions of American Telephone & Telegraph. It also operates in Brazil the radiotelephone network mentioned earlier and owns nearly half the company that operates the Mexican telephone system. Over 90% of the telephones of Latin America are linked with one another and with Europe and North America through IT&T facilities.

IT&T telephone operating companies have as their chief problem the obtaining of adequate rates. As rates are subject to government control, they have not risen so rapidly as other prices since World War II. Only in Puerto Rico has realistic rate relief been granted, and it is therefore only in Puerto Rico that IT&T finds it possible at the present time to undertake a major program of expansion to meet backed-up demand for telephones.

Cable and Radiotelegraph

IT&T's participation in cable and radiotelegraph communication stems from its controlling interest in American Cable & Radio Corp. The latter company owns All America Cables and Radio, Inc., The Commercial Cable Co., Mackay Radio and Telegraph Co., and Sociedad Anonima Radio Argentina.

Their combined facilities make it the largest American-owned international telegraph system and the only one operating both cable and radio networks. Direct cable circuits reach from the U. S. to Canada, Ireland, Great Britain,

Europe, Central and South America, and the West Indies. Direct radiotelegraph circuits operate between the U. S. and the principal countries of Latin America, Europe, Africa, the Middle East, Hawaii, and the Far East; between South America and the U. S., Europe, and the Far East; and between various Latin American countries.

The American Cable & Radio system consists of 47,000 nautical miles of submarine cable, 7,000 miles of land line, and more than 70 international radiotelegraph circuits. Six shore stations in the U. S. afford radiotelegraph communication with ships at sea. Mackay Radio and Telegraph manufactures communication and other electronic equipment for the shipping industry. Recently developed was a portable lifeboat radio to expedite rescue at sea.

A British subsidiary, International Marine Radio Co., Ltd., installs and operates radiotelephone equipment aboard British merchant vessels. It operates the telephone and telegraph equipment and the usual navigation and safety devices on the Queen Mary, Queen Elizabeth, and the Caronia.

All these activities in international communications and manufacturing make IT&T unique among its competitors and similar companies. It operates many fewer phones and does much less manufacturing than the huge American Telephone & Telegraph Co. And it is smaller too than Western Union in cable business and RCA Communications in radiotelegraphy.

But its great diversity of operations and activities in so many different countries affords it opportunities—and gives it problems—that most companies can never have.

It must contend in its telephone business, not with the regulations and whims of just one government but with those of many. It must tread gently the pathway that might lead to financial loss or to expropriation of its utility properties. And it must do all this and still make a profit, because unlike the socialized services in many countries it lacks support of tax-raised money.

But these same conditions that confront IT&T with its problems give it opportunities for growth and development. Its linkage with the industrialized countries of Europe and the underdeveloped countries of Latin America points to a future of steady growth. Its association with one of the world's fastest growing industries—electronics—adds to that promise.

But over and beyond its opportunities, the future of IT&T must necessarily depend on its willingness and determination to fulfill that promise, to make sure that it doesn't lag behind in technological progress.

Communication Research

Its research program, long fostered and supported by IT&T, shows its determination not to fall behind in technological fields. Its commercial research and development work is directed toward the improvement of its communications equipment as well as into the arena of advanced pure research.

Three separately organized laboratories in Britain, France, and the U. S. and development groups in its major factories keep over 4,000 highly specialized scientists, engineers, and technicians busy on their particular projects. Headquarters in New York prepares over-all programs and coordinates research direction and activities to prevent duplication of effort.

Present research projects are probing into the field of airborne electronics; direction finders; transistors and other semi-conductor devices; equipment miniaturization; micro-strip wiring in microwave links capable of handling a number of telephone channels as well as television and radar signals; printed circuits; color television; and many other phases of wire and wireless communication.

That IT&T stands ready to develop its potential is attested to by its past management. There is no evidence that it is satisfied to rest on its past achievements, to reminisce about its sometimes spectacular, sometimes checkered career. All evidence indicates that it, like so many other American companies, bases its plans on steady growth, that it looks ahead to a continual increase in its service to customers around the world.

(Advertisement)

Compact Designs

in electrical equipment use Irvington's high-temperature insulation

The current trend in the design of motors, generators, transformers and other electrical equipment is toward smaller, lighter units operating at higher temperatures. These compact designs have been made possible largely through the development of high-temperature insulating materials by Irvington Varnish & Insulator.

These high-temperature materials, designated as Class "H" insulation, include glass cloth varnished with silicone resins; glass cloth coated with silicone rubber or Teflon*; asbestos treated with silicone resins; and special slot insulations. Insulating varnishes specially formulated for high heat resistance have also been developed by Irvington.

For less severe temperature requirements, Irvington Class "A" and Class "B" flexible insulations are supplied. Products in these groups include varnished and coated cambric, canvas, paper and nylon, for continuous operation up to 85° C. (Class "A"); and varnished glass cloth for operation at 105° C. (Class "B").

Insulating varnishes developed by Irvington during nearly 50 years of research and manufacture are also available to meet the needs of the electrical industry. In addition to the high heat-resisting type, Irvington offers a comprehensive line of other varnishes, including internal curing, conventional baking and air drying types, as well as machinery enamels.

To assist the industry in the use of these insulating materials, Irvington representatives in more than 30 countries are prepared to supply samples and literature, and to offer technical advice. The experience which Irvington, as one of the oldest and largest manufacturers of electrical insulating materials, has accumulated in the application of these products is available to you through your Irvington representative. Why not get in touch with him? Irvington Varnish & Insulator, Division of Minnesota Mining and Manufacturing Company, Irvington 11, New Jersey, U.S.A.

* T.M. Reg. U.S. Pat. Off. by du Pont

Storage capacity increased 80% at Tuborg Brewery by use of Clark Trucks

Rapid post-war expansion of sales, domestic and export, led Tuborg Brewery, one of Denmark's largest, into a broad modernization program—including a fleet of Clark fork trucks which ranks as the largest in Denmark. Benefits achieved by this system of fork trucks and pallets were extremely profitable—

- **storage capacity increased by 80%**
- **70% greater volume transported without increasing lorry capacity**
- **easy loading by units from docks to vessels' holds, for export**
- **faster handling of all supplies—on pallets loaned by Tuborg; with greatly reduced accident damage and costs**
- **quick, simplified check-up on shipments and inventories**

Needless to say, Tuborg is most gratified by these extraordinary results.

The Clark line of gasoline, electric and diesel powered fork-lift trucks, towing tractors and operator-led trucks is the most complete in the world. Therefore, your Clark distributor is best equipped to provide the most suitable tools for your specific requirements. Consult the Clark distributor in your country—his facilities are at your disposal.

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EXPORT DIVISION
CLARK EQUIPMENT COMPANY
Battle Creek 73, Michigan, U. S. A.

America's First Jet Transport Nears Flight

America's first jet transport—the Boeing 707—was rolled out of its hangar at Renton, Washington, two months ahead of schedule. The first model, designed primarily as a tanker, was christened "Jet Stratotanker"; passenger version will be known as "Jet Stratoliner."

The plane's lines draw heavily on the basic design of the B-47 Stratojet, B-52 Stratofortress, and Stratofreighter. Wings are swept back approximately 35°; the four Pratt and Whitney JT3-L twin-spool turbojet engines (commercial counterparts of the B-52's J57's) are housed in widely spaced engine pods, slung high and well forward from the wing.

Other specifications: Span, 130 ft.; length, 128 ft.; estimated gross weight, 190,000 lb. The giant plane is expected to have cruising speed of about 550 miles per hr. and will carry from 80 to 130 passengers. Flight plans include New York-London nonstop in less than 7 hr.

Original plans to fly the plane in late June were postponed because of a mishap during runway taxi tests in which the left landing gear gave way. Nevertheless, its first flight will take place probably early this summer.—Aviation Wk, May 17, p19; May 24, p16 and 38; May 31, p13; June 7, p15

New Unifining Process

A new refining process, called Unifining, improves petroleum refinery stocks by hydrogenation over catalysts containing cobalt and molybdenum. It removes sulfur, nitrogen, and metals. When applied to cracked distillates, it saturates olefins and decomposes oxygen compounds to make higher-quality products.

Its biggest use may be in feed preparation for catalytic reforming. A particularly valuable application is the simultaneous preparation of such feedstock and high-grade stove oil by processing of coker distillates.

The process is licensed jointly by Union Oil Co. of California and Universal Oil Products Co.—Oil & Gas J, Apr 19, p211

Toronto Fair Spurs Trade

NORTH AMERICA'S biggest annual trade fair this year exceeded its promoters' fondest hopes. Held in Toronto, Canada, June 6 to 11, the Canadian International Trade Fair opened its doors to more than 25,000 visitors. On display were products ranging from parasols to earthmovers. About 1,450 exhibitors from 27 different countries had their goods inspected, and in many cases bought, by businessmen from all over the world.

Added to this year's fair was a section featuring the aviation industry. More space was devoted to construction equipment; less space to machine tools. On the whole it was a well balanced trade fair with practically every industry represented.

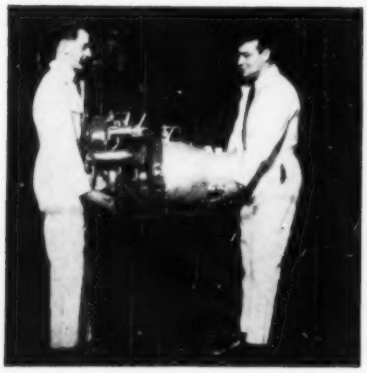
For world businessmen, the fair provided opportunity to see what the competition was doing and to further develop the North American dollar market. Visitors and exhibitors alike testify to their success in doing just that. Many exhibits bore a "sold" tag before the first week of the fair was over. Visitors all found the exhibits interesting and they made many useful contacts that they expect will lead to much new business.

The trade-fair administration is already hard at work on next year's fair. They plan increased emphasis on plastics materials and processing and on chemicals. Their objective is to broaden the scope of the fair, to make it truly an international market place where buyer and seller can meet.—An original Digest article.

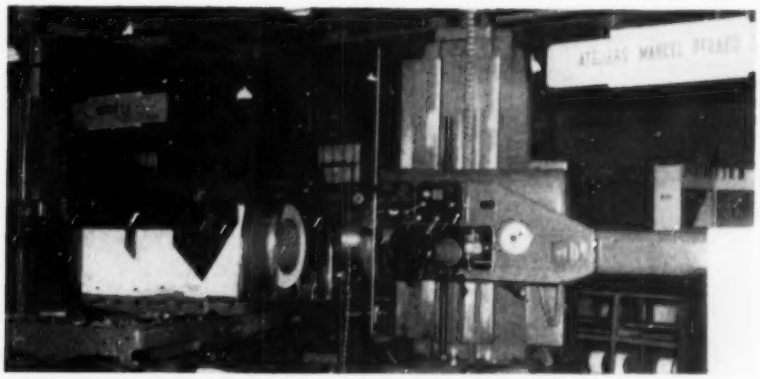
WORLD BUSINESSMEN come to Canadian International Trade Fair.

OVERHEAD MAINTENANCE is simplified with Mitchell Maintenance Co.'s Lift-A-Loft. Pushbuttons raise or lower platform; move it back and forth.

ADJUSTABLE-STROKE PRESS was shown by Les Ateliers H. Raskin.



GAS TURBINE for industry is made by Blackburn & General Aircraft Ltd.



UNIVERSAL BORING MILL built by Ateliers Marcel Pegard S.A., Belgium, and shown by J. H. Ryder Mach'y Co., Canada, features power-operated table.

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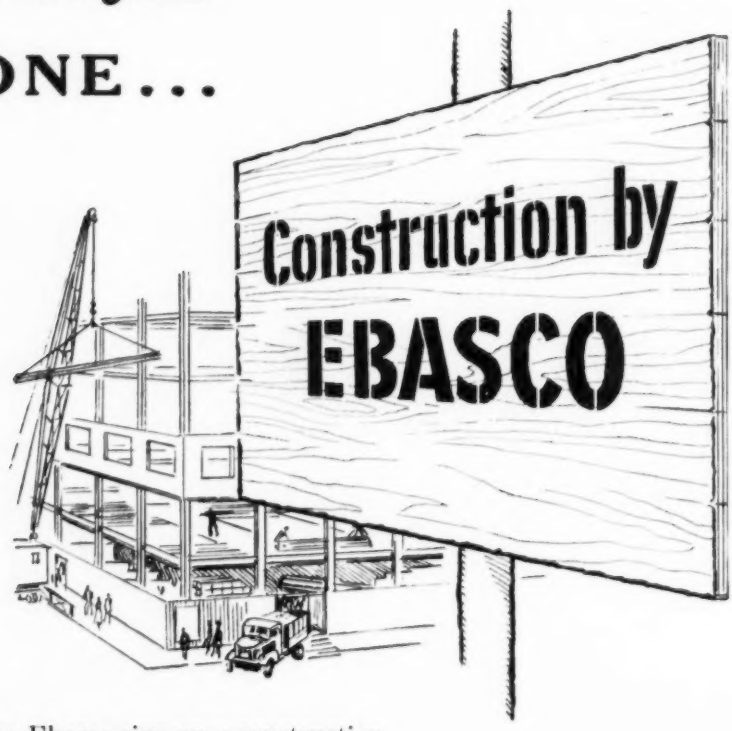

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Induction Brazing Belt

Soldering and brazing of small transformer parts is speeded up greatly by belt conveyor attached to an induction heater at Triad Transformer Co., Venice, California. The endless asbestos-covered canvas belt moves parts through heating coils at easily controlled speeds. A simple hand control positions belt up or down.

In soldering hermetic seals to transformer lids, the operator simply places the terminals in the lids and drops a preformed ring of soft solder around each terminal. When the lid has passed the coil, soldering is complete.—Electronics, June, p248

High-Pressure Containers

Fibrous glass-reinforced plastic high-pressure cylinders were made on an experimental basis by Taylor-Wharton Iron & Steel Co., Cincinnati, for the U. S. Air Force.

Cylinders with 4-in. O D by 20 in. long were fabricated by winding eight strands of fibrous-glass yarn simultaneously on a suitably shaped core. A metal insert at the valve end opening permits metal-to-metal contact for threads.

The weight of the completed cylinder, less valve, is 5¼ lb., or almost 30% less than the same size of steel cylinder. One cylinder, 8¾ in. in dia. by 58 in. long, withstood up to 9,000 lb. per sq. in. before failure.—Mod Plastics, June, p386

Pyramids Protect Bank

Engineers had to provide economical protection to the banks of a waterway near a hydroelectric plant in Washington state. Because of long haulage distance, rock riprap was too expensive. Instead, precast concrete pyramids were used.

Each pyramid is 4½ ft. square at the base and 4 ft. high. Double steel eyes cast into the base and apex allow easy handling with a truck-mounted boom. After placing the pyramids, rockfill from a river bar 100 ft. downstream will be bulldozed behind the pyramids during low-water periods to give the bank additional support.—Const Meth & Equip, June, p17

International Business Briefs

Geneva—The Swiss government, acting through its Federal Railroad system, will lend France's nationalized railways 200- to 250-million Swiss fr. ($40- to $50-million) for electrification of three French lines of access to Switzerland. Swiss electrification material will be used. This follows last year's Swiss loan of 140-million fr. to West Germany's railway system for electrification of the Karlsruhe-Basle line.

Stockholm—Svenska Metallverken of Vaesteras has shipped a $1-million fully automatic wire rolling mill to the Anaconda Wire and Cable Co., U. S. Including electrical machinery by the Asea company and ball bearings by SKF, it is expected to be running in America this year.

Rio de Janeiro—The American RCA Victor Co. will build a $1.5-million factory in Brazil to produce 6-million radio tubes yearly. Products will save Brazil up to $7-million in vital foreign exchange each year.

Paris—The Comptoir Franco-Belge des Tubes, representing all French and Belgian pipe exporters, won a 28,000-ton oil-pipe contract from Mexico's Petroleos Mexicana (Pemex).

Bombay—Dumex Ltd., representing six Danish pharmaceutical makers in India, has opened a new plant here to produce a baby food made of Danish milk powder. Already packaging and processing antibiotics, company will also expand output of pharmaceuticals.

INDUSTRIAL SOLID TIRES
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There is a MONARCH cushion or universal-type solid tire for every lift truck application. As a leading producer of pressed-on tires, MONARCH supplies a complete range of types and sizes to lift truck manufacturers and users throughout the United States.
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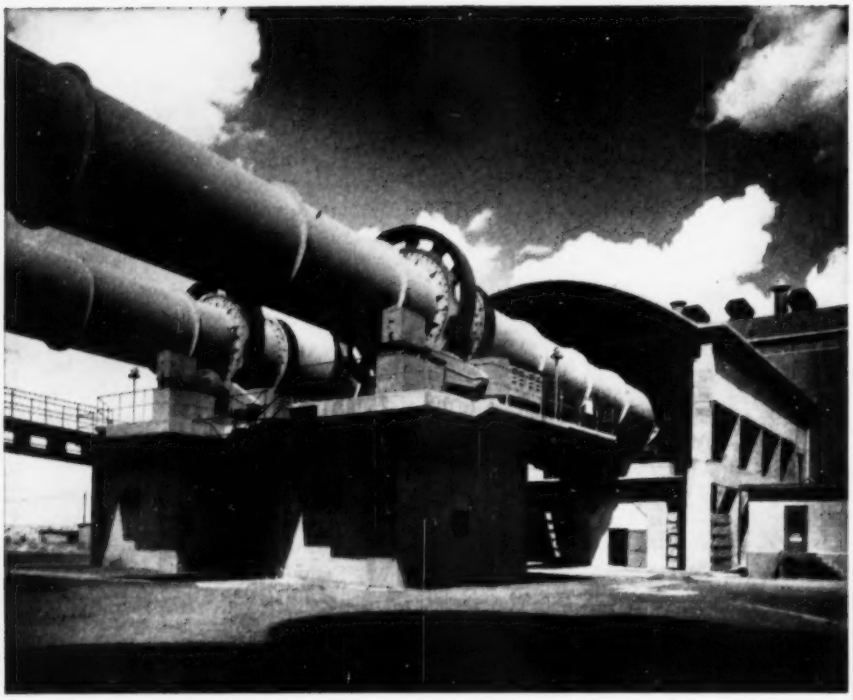

Reducing the Cost of Cement Production

THROUGHOUT the world Allis-Chalmers equipment is being used by cement producers to increase production and reduce costs. Allis-Chalmers can supply either a complete modern cement plant or component machinery for modernizing existing plants.

Allis-Chalmers air-cooled kiln ends, for example, will pay for themselves in refractory savings alone. Brick need not be changed as frequently as in other types. As a result, you have fewer shutdowns.

Movable firing hoods supplied by Allis-Chalmers can easily be adjusted to compensate for expansion and contraction of kilns. They maintain a good air seal with kilns, keeping cool air out and reducing hot air loss at kiln end. Heavy construction means hoods will stay round and rigid after years of service. Standard refractory brick is used.

And Allis-Chalmers air-quenching coolers give maximum kiln economy and fuel utilization. Hottest air from the cooling clinker is recaptured and returned as secondary air to the kiln, saving fuel costs. True air-quenching of clinkers results in a product that is easier to grind.

To obtain complete information on Allis-Chalmers products for the cement industry, contact the Allis-Chalmers representative in your country, or write:

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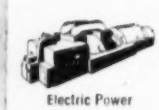
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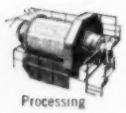
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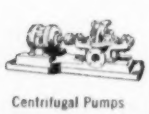
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MANAGEMENT REPORT

How is your health today? Along with executive responsibilities frequently come ulcers, heart trouble, other physical ailments. Here are rules to follow *if you want to die young:*

- Put your job first, yourself second.
- Go to the office evenings, weekends, holidays.
- If you don't work late at the office, take a brief case full of papers home.
- Don't rest at lunch-time; always make it a conference.
- Don't bother with hobbies—they take time away from your work.
- So do vacations—better not take any.
- Never say no to a request; accept all invitations to meetings, banquets, committees.
- Never delegate responsibility, carry the whole load yourself. After all, you are the indispensable man. Of course, after you follow these rules, your company will have to find someone else to fill the job you have.—Iron Age, June 3, p73

Wage incentives applied to direct and indirect labor cut production time by 27% at Jones & Lamson Machine Co. Employees increased take-home pay by 30%. The gains came not so much from increased speed as from increased efficiency—improved methods, better working habits, elimination of delays. Time studies showed that wasted time, prior to installation of the system, pulled workers' performance to a low level.

Here is an example how the system helped. When standards were established for timekeepers, 25 people were doing this work. Methods study made for setting of standards resulted in redesigned desks, new time tickets, and new work centers. After incentives were installed, 11 timekeepers did the work previously done by 25. Saving was $55,000 a year.—Am Mach, May 24, p118

Since Mar 15, employees of Bank of Manhattan Co., New York, have been wearing a button carrying this series of numbers: "57-155-25,000." It was part of plan to accomplish these objectives: (1) give the employees a greater feeling of unity, (2) attract new accounts. Here's how the plan worked for the bank:

A customer would ask a teller, "What is that?" This query would be the teller's opening. "The 57," he would reply, "is our number of branches, the 155 is the number of years the bank has been in business, and 25,000 is the number of new accounts we are trying to get by June 15." Then the teller would proceed to sell the customer on the services offered by the bank.

Needless to say the plan worked. The new accounts added up to over $26-million in new business for Bank of Manhattan, and the total cost of the drive, including prizes to the employees bringing in the most new accounts, was a mere $55,000.—Business Wk, June 19, p134

Is poor morale hurting your organization's productivity? If the answer is yes, you can improve morale with these five steps.

- Develop and publish your company's objectives and policies.
- Create relationships and conditions. Give your supervisors pride in the accomplishment of their subordinates.
- Develop acceptance. Build in the minds of your supervisors an understanding and acceptance of what your company is trying to do.
- Conduct well-planned and effective meetings regularly.
- Issue well-designed and interesting publications as part of a well integrated communications setup.

Even if you have no morale problem, these steps are well worth considering. Profit margins often depend on willingness to work.

Standardization will be an important factor in Europe's improving its trade and economic conditions. The Organization for European Economic Cooperation recognizes this. It urged its member countries "to adjust differences in national regulations and technical standards that prevent equipment and apparatus manufactured and officially tested in one country from being used in another country."

You can help OEEC in its quest for standardization by supporting your national standardizing body. In the long run you benefit. Equipment will be easier to obtain. Prices will be competitive. And it will be easier to sell your product.

Surplus materials and obsolete equipment can be a headache. One company, Minneapolis-Honeywell Regulator Co., not only solved its surplus problem but managed to make money doing it.

The company has set up a shop to give the public a chance to buy surplus and obsolete items. Hobbyists and the postwar do-it-yourself trend have helped keep sales high. Small businesses patronize the store, too. You would be surprised at what an imaginative customer can make out of a piece of surplus.

Zinc wheels—like those originally used in thermostats—inspired one man to build 1,200 toy wagons. Surplus aluminum boxes were converted into amplifiers by another customer.

PRODUCTION IDEAS

from Manufacturers' Catalogs

Plant Layouts—How to replace conventional plant-layout procedures with low-cost plant-layout systems is the subject of this company's bulletin.—Peerless Photo Products, Inc., Shoreham, Long Island, N. Y.

Harbor Control Systems—The use of shore based radar in port control operations is described in a technical bulletin.—R.C.A., International Div., Radio Corp. of America. Gloucester, N. J.

Pressure Blasting—The advantages of high-speed pressure blasting in deburring, die and mold polishing, scale removal are given in a booklet entitled "Pressure-Blast."—The Cro-Plate Co., 747 Windsor St., Hartford 5, Conn.

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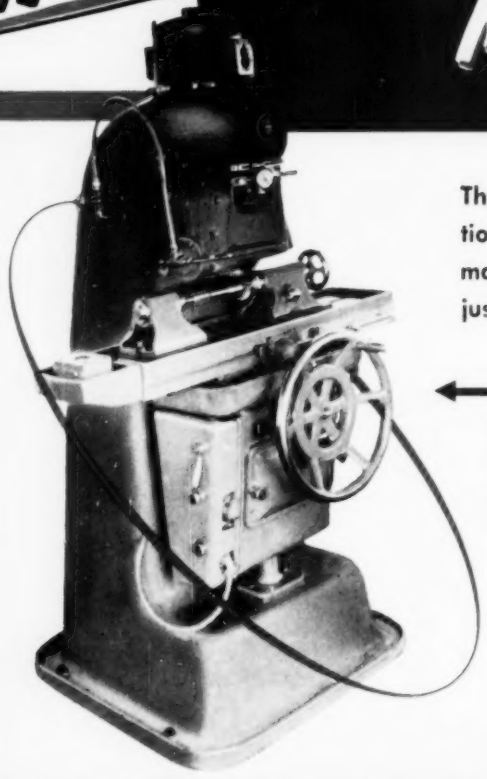

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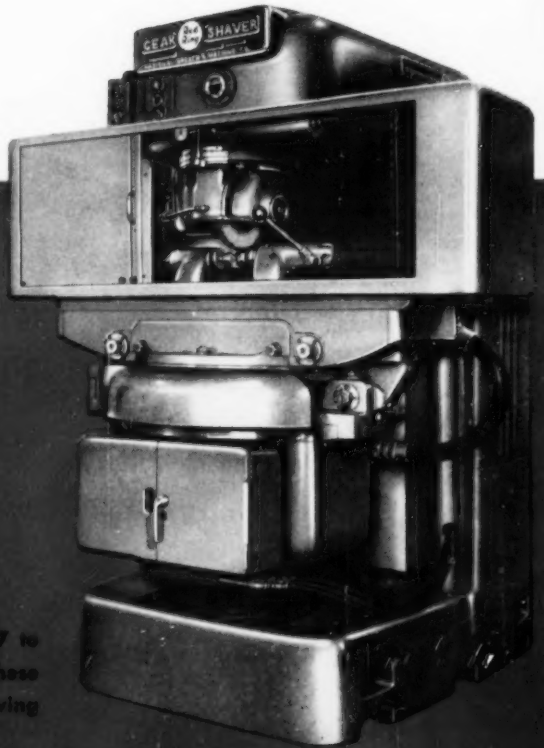

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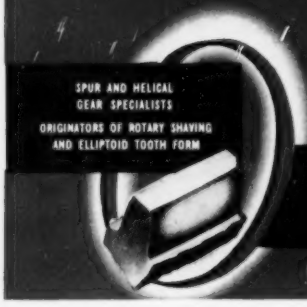

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